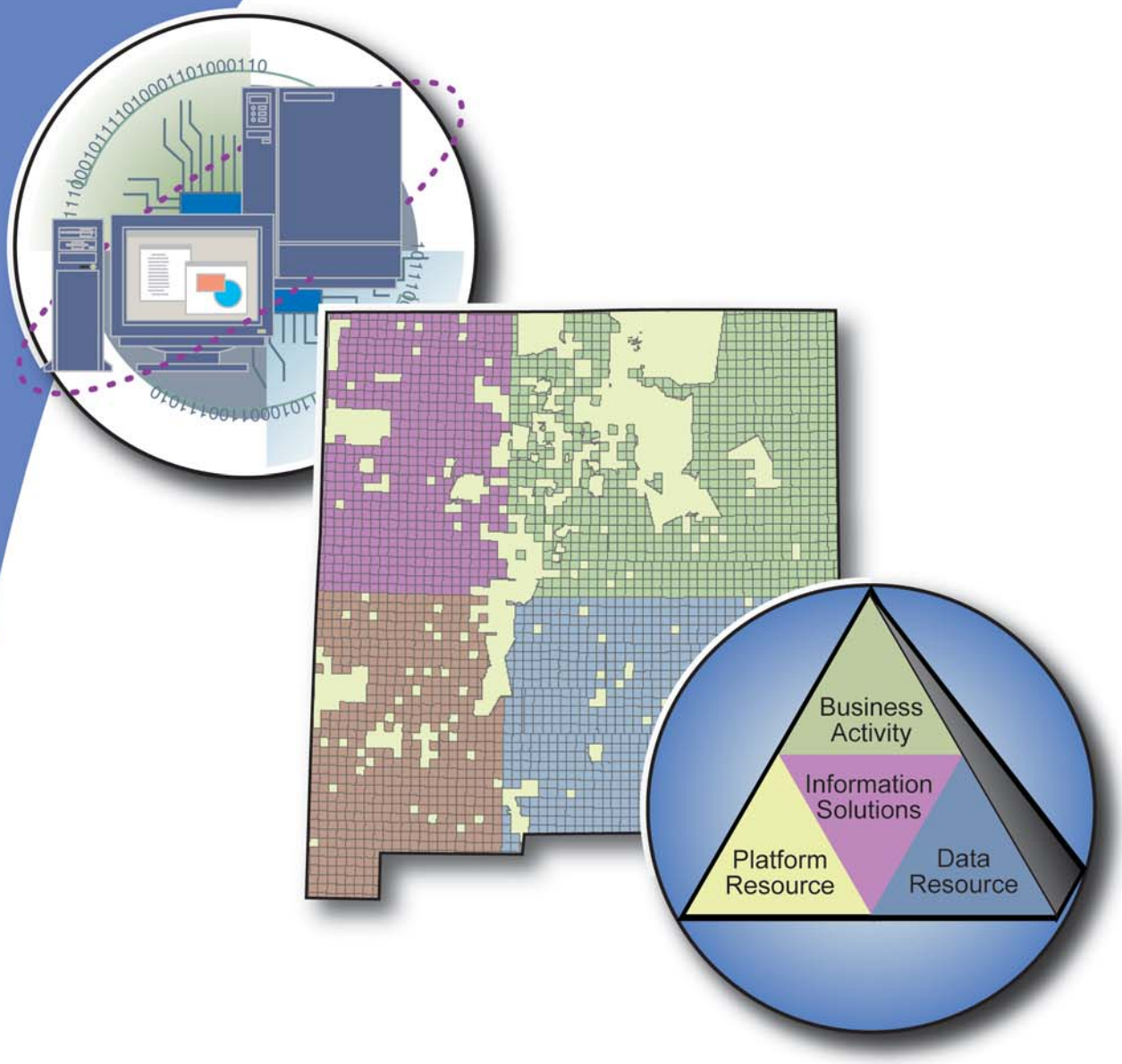
New Mexico Geospatial Strategic Plan

Phase 1



Knowledge Systems & Solutions

August 2007

WESTON SOLUTIONS

07-0048 Cover.ai

GAC *New Mexico Geospatial Advisory Committee*

MEMORANDUM

7 January 2008

TO: Roy Soto, Cabinet Secretary, DOIT
THROUGH: Mike Baca, GAC DOIT Representative
THROUGH: Larry Brotman, GAC Chair
FROM: Gar Clarke, Chair NM Geospatial Strategic Plan Working Group

SUBJECT: ***Final – New Mexico Geospatial Strategic Plan (Phase 1)***

Please find attached the "Final Deliverable" of the ***New Mexico Geospatial Strategic Plan – Phase 1(NMGSP).*** This document incorporates the comments and edits of over 65 individuals representing State, local, federal, and private interests. Not all comments were included. However, the intent was to present the "consensus" view.

This document was not intended to be a "streamlined" edition to provide management/executives with a small footprint of Strategic Planning for Geospatial Technologies, yet a gathering of data and information supportive of the FGDC 50 States Initiative that could be used to extract information to support marketing, development, and implementation. As recorded during the GIS Summit (June 2006), professional forums, and supported by activities within other states this plan recommends:

- Establish immediately the Geographic Information Officer (GIO) position reporting to the Office of the Chief Information Officer (OCIO) / Department of Information Technology Office (DOIT) to fulfill coordination, governance, policy, planning, and assessment role regarding statewide GIT efforts.
- Designate and fund Earth Data Analysis Center (EDAC) to host the state GIS clearinghouse (RGIS) and provide GIS services throughout the state.
- Provide $850,000 annually towards funding the GIO position, State GIS clearinghouse, web-based data distribution, and specialized GIS services.

This document is considered a "Working Plan" that is intended to be updated as successes are realized. As such we are presenting the plan for comment within a public forum. In addition, to finalize our obligation to the funding source, USGS, I will be releasing a copy to our New Mexico Geospatial Liaison, the Federal Geographic Data Committee, and the National States Geographic Information Council.

Regarding State Agency IT participation please advise how best we can realize the recommendations as presented within the New Mexico Geospatial Strategic Plan.

GAC: The New Mexico Geospatial Advisory Committee (GAC) guides the use and development of Geospatial Technologies within New Mexico by advising the State Department of Information Technology (DOIT). The committee meets monthly and includes representatives from state, federal, and local government. For a copy of our Charter and Strategic Plan, please access the following web page: *http://www.gisac.state.nm.us/*

New Mexico Geospatial Strategic Plan
Phase I

Prepared for:

Roy Soto, Cabinet Secretary
Department of Information Technology
State of New Mexico
Santa Fe, New Mexico

August 27, 2007
Last Revised
January 2008

Prepared by:

Weston Solutions, Inc.
190 Queen Anne Avenue North, Suite 200
Seattle, Washington 98109-4926
Phone: (206) 521-7600
Fax: (206) 521-7601

WO # 14006.001.001

Table of Contents

LIST OF TABLES

LIST OF FIGURES

Table of Contents (Continued)

LIST OF ABBREVIATIONS AND ACRONYMS

BLM	Bureau of Land Management (Federal)
BOR	Bureau of Reclamation (Federal)
CIO	NM Chief Information Officer
DFA LGD	NM Department of Finance Administration Local Government Division
DOIT	NM Department of Information Technology
EDAC	NM Earth Data Analysis Center
EMNR	NM Energy Mineral and Natural Resources Department
GAC	NM Geospatial Advisory Committee
GDACC	NM Geospatial Data Acquisition Coordination Committee
GIT	Geospatial Information Technology
GIO	Geographic Information Officer
GIS	Geographic Information System
GOS	Geospatial-One-Stop (Federal)
GSP	GIS Strategic Plan
ISC	NM Information Systems Council
ISD	NM Information Services Department
ITC	NM Information Technology Commission
ITMO	NM Information Technology Management Office
NHD	National Hydrography Datasets
NMAC	New Mexico Association of Counties
NMGIC	New Mexico Geographic Information Council
NMML	New Mexico Municipal League
NSDI	National Spatial Data Infrastructure
NSGIC	National States Geographic Information Council
OCIO	NM Office of the Chief Information Officer
RGIS	NM Resource Geographic Information System
SDI	Spatial Data Infrastructure
OSE	NM Office of the State Engineer
SSDI	State Spatial Data Infrastructure
TRD	NM Tax and Revenue Department
UNM	University of New Mexico
USACE	U.S. Army Corp of Engineers
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WGA GIC	Western Governors' Association Geographic Information Council

1. EXECUTIVE SUMMARY

1.1 Overview

New Mexico is rich in data, information, and resources. Some noteworthy milestones have been achieved by voluntary efforts within the geospatial community using geographic information systems (GIS). However, there is an immediate and urgent need for coordination of geospatial information technology (GIT) to:

- Enhance local governance using streamlined business processes among state, federal, local, and tribal agencies.
- Maximize value for committed funding in numerous GIT projects.
- Reduce or eliminate duplication of efforts and resources among existing agencies.
- Provide leadership and instruction regarding the accumulation, dissemination, analysis, and management of geographic information.
- Educate citizens, state agencies, local governments, and policy makers to benefit from GIT.

The GIS Strategic Plan (GSP) meets these needs to achieve both short and long term benefits for the State. The GSP represents the first step toward expanding a statewide enterprise GIT infrastructure into an enterprise decision support technology involving:

- GIS coordination.
- Secured information sharing among government entities.
- Latest data and advanced service delivery by enhancing the existing state clearinghouse.
- Projects built for common application and data requirements.
- Shared GIT goals that satisfy the operational business needs of all users.

The state can achieve the goals and objectives as identified in the GSP by acting as an enterprise; it can strive for and achieve maximum effectiveness by adopting the mindset of a single organization with unified vision and purpose. Per the benchmarking study that was conducted as part of this GSP (see Appendix A), the goals of the GSP are in sync with those currently being pursued by most states. For instance:

- A significant majority (80%) of the interviewed states that do not have a Geographic Information Officer (GIO) office believe a GIO office is needed and are actively pursuing a GIO office (see Figure 1). About a quarter of the states interviewed currently have a GIO office.

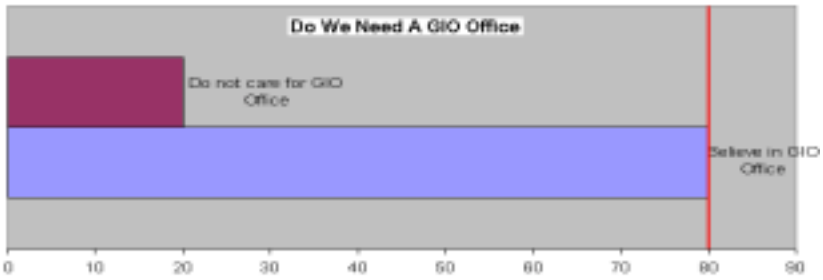


Figure 1: GIO Office Need Response (percentage)

- Significantly over half (68%) of the interviewed states receive some amount of base funding to sustain the operations of a State GIS Coordinator (see Figure 2.)

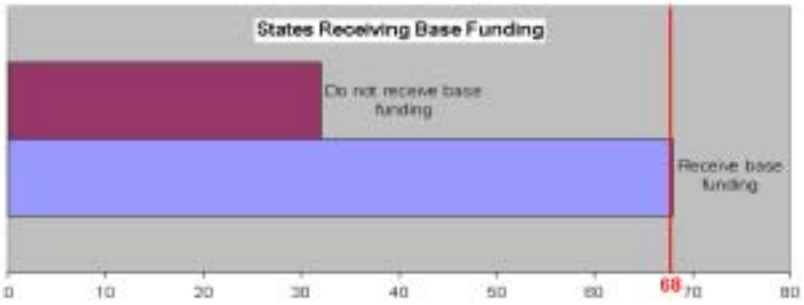


Figure 2: Base Funding Recipients (percentage)

1.2 New Mexico's GIT Vision

The statewide GIT vision recommended for New Mexico and developed within this GSP include:

- Promoting governance through GIT partnerships and focused coordination among various agencies – federal, tribal, state, and local government, the private sectors and educational entities – by encouraging and supporting the contributions of all individuals in the GIS community.
- Reducing redundancy and cost for GIT endeavors and utilizing funds more effectively through coordinated and shared projects.
- Defining GIS technology as a core component of mainstream information technology in support of important decision making in areas such as homeland security, local governance, E911 efforts, and others.
- Developing an organized, well-managed, and secured framework through a statewide GIS clearinghouse to enable data integration and sharing of both spatial and non-spatial data, applications, services, and information.
- Increasing awareness and knowledge of all citizens and businesses in the state regarding the uses and benefits of all geospatial technologies.
- Leveraging resources to accomplish measurable goals and objectives by solving real-world problems.

- Spreading the benefits of geographic information and geospatial technology broadly and equitably to improve quality of life as well as benefit the environment.

1.3 Issues

A series of workshops were conducted in Santa Fe and Albuquerque to understand the requirements of the GSP and actions necessary to achieve its goals and objectives.

Major issues identified and in need of correction:

- Lack of both funding support and a unified approach for statewide GIT efforts.
- Inadequate data, data models, applications, and services to aid GIT efforts within the state to support decision making systems.
- Limited support for a state GIS clearinghouse, State Spatial Data Infrastructure (SSDI), National Spatial Data Infrastructure (NSDI), and Geospatial-One-Stop (GOS).
- Lack of a political champion for GIS, limited sponsorship from legislative engagements, and inadequate political outreach.
- Extremely low scores for New Mexico on a nationwide survey of statewide GIS coordination conducted by the National States Geographic Information Council (NSGIC); the state achieved only two out of nine criteria (per the NSGIC survey), but only one of these was achieved effectively. The details are presented in Section 4.3.1, Table 4-1A and 4-1B.

Figure 3: Statewide Nine Coordination Criteria

- Absence of business plans for each strategic recommendation (see Section 7).

1.4 Recommendations

The following strategic recommendations are presented in this GSP to align with the identified issues and satisfy the state's vision:

- Establish immediately the Geographic Information Officer (GIO) position reporting to the Office of the Chief Information Officer (OCIO) / Department of Information Technology Office (DOIT) to fulfill coordination, governance, policy, planning, and assessment role regarding statewide GIT efforts. The results of the benchmarking study (see Appendix A) also support the need to create a formal GIO office.
- Provide $850,000 annually towards funding the GIO position, State GIS clearinghouse, web-based data distribution, and specialized GIS services.
- Involve the highest levels of management, political, and legislative bodies within the state in GIS councils and committees.
- Establish a Spatial Data Infrastructure (SDI) subcommittee that includes representative membership from existing GIS councils and committees, data stewards, and data consumers.

- Designate and fund Earth Data Analysis Center (EDAC) to host the state GIS clearinghouse and provide GIS services throughout the state.
- Develop business plans for each strategic recommendation (see Section 7).
- Establish recurring funding to support geospatial coordination, GIT efforts, GIS services, and clearinghouse activities within the state.

1.5 Benefits

The following benefits will result from the strategic recommendations:

- Significant return on GIT investment.
- Better local governance through enhanced inter-agency communication, coordination, and planning.
- Higher levels of information security, emergency preparedness, and regional homeland security.
- Contributions to SSDI, NSDI, and GOS efforts through an enhanced state GIS clearinghouse.
- More effective planning towards potential funding sources for state GIT efforts.
- Increased visibility and demonstrated effectiveness of GIT to achieve legislative sponsorship.
- Leveraging of limited resources to their full potential.
- Decreased redundancy and duplication of efforts.
- Enhanced GIT awareness among agencies, policy makers, and citizens; thus allowing all to benefit from GIT technology, as well as improving the environment and overall quality of life.

1.6 Costs

The annual estimated costs are provided in Table 1-1.

Table 1-1 – Estimated Annual Costs to Implement Recommendations

Recommendations	Estimated First Year Budget
Establish and Maintain Geographic Information Office	GIO Office Budget:$150,000
Acquire Management Support and Sponsorship	
Establish and Maintain GIS Councils and Committees	GIS Services Budget: $300,000
Develop and Update Business Plans	
Establish and Maintain State GIS Clearinghouse	GIS Clearinghouse Budget: $400,000
Distribute Information via Web-based Media	
TOTAL Budget (Annual)	**$850,000**

2. INTRODUCTION

This section is divided into the following subsections relating to the GIS Strategic Plan (GSP).

- Overview
- Purpose
- Contents

2.1 Overview

NSGIC has published the "Fifty States Initiative" towards building a National Spatial Data Infrastructure (NSDI). Every participating state is required to contribute to NSDI through their SSDI. An in-depth analysis of NSGIC survey data and guidelines for statewide GIT efforts reveals conclusively the expressed need for statewide GIS coordination for geographic information management within New Mexico. The first step towards implementing NSGIC guidelines regarding statewide geographic information is to develop a strategic plan. This GSP represents the strategic plan for statewide GIS coordination as guided by NSGIC directives.

The State of New Mexico is taking an incremental approach towards formalizing the statewide geographic information coordination efforts. The focus is on finding the business case, needs, and benefits of such coordination through the development of a strategic plan. Strategic planning is a dynamic process with a starting point and continual refinement. This GSP represents the starting point for such a process and includes:

- Considerable flexibility for adjusting the plan dynamically over time without sacrificing momentum.
- Programmatic requirements and objectives for building detailed business plans.
- Recommendation for a central mechanism for coordinating elements of geographic information and relevant technology throughout the state without losing strategic perspective.
- Recommendations for various other activities that need to happen for a successful statewide GIT program in New Mexico.

2.2 Purpose of Strategic Plan

This strategic plan presents a statewide perspective on the management and coordination of enterprise geographic information in New Mexico. The plan identifies the goals and objectives for GIS coordination in the state. It also presents a comprehensive, long-range view of geographic information management that will provide direction for detailed tactical planning that should routinely support the SSDI and NSDI efforts.

This report follows the Strategic Plan Process Map Template, Strategic Plan Template, and overall recommendations and guidelines published by NSGIC. NSGIC's "Fifty States Initiative" and the statewide coordination criteria were closely referenced in the preparing of this plan.

This plan sets out to identify and document the following:

- **Present Situation** – The current state of New Mexico's efforts in collaboration, coordination, and geographic information management.
- **Goals and Objectives** - Long-term, overarching strategic directions and foundation for geographic information management in New Mexico.
- **Programmatic Requirements** – Statewide GIT programs needed to fill gaps between the State's vision and the present reality.
- **Strategic Recommendations** - Recommendations to fulfill statewide GIT efforts and implementation techniques.

2.3 Contents of Strategic Plan

This document is organized into the following sections, in addition to the Executive Summary and this Introduction:

- Section 3: Strategic Planning Methodology – Describes the methodology used in developing this GSP.
- Section 4: Current Scenario Assessment – Presents the history of New Mexico's statewide GIS coordination efforts and an analysis of the current situation.
- Section 5: Goals and Objectives - Sets forth the vision for geographic information management in New Mexico and describes the scope of the identified goals and objectives.
- Section 6: Programmatic Requirements – Identifies programs required to bridge the gaps between the present scenario and the State's goals.
- Section 7: Strategic Recommendations – Defines recommendations for implementing the identified programs.

3. STRATEGIC PLANNING METHODOLOGY

This section describes the following components of the strategic planning methodology:

- NSGIC Guidelines
- Strategic Planning Process
- Interviews and Workshops
- Document Preparation Process

3.1 NSGIC Guidelines

The NSGIC goal: "NSGIC provides a unified voice on geographic information and technology issues, advocates State interests, and supports its membership in their statewide initiatives. The Council actively promotes prudent geospatial information integration and systems development. NSGIC reviews legislative and agency actions, promotes positive legislative actions, and provides advice to public and private decision-makers. NSGIC members are actively involved in the coordination and application of geospatial technologies in their States. They are often at the forefront of GIS and information technology innovation. Many are top-level managers who recommend specific hardware and software purchases or define GIS procurement policies for their jurisdiction. These State GIS coordinators exert a great deal of influence on geospatial policies and resource development in their States." (Please visit www.nsgic.org/about/index.cfm for further details.)

The NSDI goal: "The goal of NSDI is to reduce duplication of effort among agencies, improve quality and reduce costs related to geographic information, to make geographic data more accessible to the public, to increase the benefits of using available data, and to establish key partnerships between the federal government and states, counties, cities, tribal nations, academia and the private sector to increase data availability." (Please visit www.fgdc.gov/nsdi/nsdi.html for further details).

NSGIC guidelines were followed very closely in preparing the foundation for this GSP. NSGIC provides documentation and guidelines at its website, www.nsgic.org. NSGIC's "Fifty States Initiative" discusses in detail:

- The nine-point coordination criteria.
- The strategic plan, strategic process map and business plans.
- Effective statewide GIS coordination characteristics.
- The seven-point measurement criteria for successful implementation (e.g., NSDI, SSDI).
- The eight points for outreach activities to ensure the initiative's success.

NSGIC recommends the following preliminary planning and strategizing phases:

- Identifying factors that will ensure a successful planning process.
- Reviewing any existing strategic plan(s).
- Reviewing primary strategic goals.
- Reviewing other intra-organizational mandates and mission statements that impact the current activity.
- Reviewing other relevant documents and materials.

In accordance with these guidelines, two important studies were tailored and conducted for New Mexico prior to creating this GSP:

- Benchmarking Study – The questionnaire was custom tailored for New Mexico's needs with the NSGIC guidelines in mind. This benchmarking study (see Appendix A) shows that the need for GIS coordination is shared by most states and also demonstrates that New Mexico is lagging in GIS coordination efforts.
- State Framework Data Inventory – The parameters for each framework data layer were determined in accordance with the NSGIC guidelines. This inventory (see Appendix B) comprises the SSDI, which eventually will contribute to the NSDI. This inventory provides the starting point for creating individual business plans.

3.2 Strategic Planning Process

The strategic plan process map (NSGIC guideline) lays out a phased approach for developing the strategic plan. The major phases are as follows:

- Getting Started
- Preliminary Planning
- Strategizing
- Authoring the Plan
- Reviewing and Approving the Plan

The recommended NSGIC process is depicted in Figure 4.

Figure 4 – Recommended NSGIC Process

The Strategic Planning Committee (representatives from New Mexico Geographic Information Council (NMGIC), Geospatial Advisory Committee (GAC), and various other stakeholders identified as relevant and appropriate) provided guidance and input during the development of the plan.

Figure 5 presents the activities and steps included in the strategic planning process, adjusted for relevance to the State of New Mexico.

Figure 5 – Strategic Planning Process at New Mexico

3.3 Interviews and Workshops

A series of workshops were conducted in Santa Fe and Albuquerque from April 9-11, 2007. The following factors were considered in identifying the stakeholder participants for the workshops:

- Must represent a diverse cross-section of the geospatial community in New Mexico that includes state, federal, tribal, county, and municipal governments; the universities; the national laboratories; research centers; rural associations; and inter-governmental associations.
- Must represent all New Mexico constituencies.
- Must understand and use NSGIC's "Fifty States Initiative" to guide the GSP process and tailor the GSP to meet New Mexico's unique needs.

The benchmarking and state framework data inventory studies were conducted following the workshop series; the results of the studies can be found in the appendices of this document. The goal of the workshops was to:

- Improve understanding of maturity, standards, completeness, and effectiveness of statewide GIT efforts within New Mexico per NSGIC guidelines.
- Improve understanding of existing issues within the state with reference to geographic information coordination and management.
- Solicit options for an organizational structure for a GIT Coordination Office.
- Identify and clarify budget, funding sources, and responsibilities of the GIT Coordination Office.
- Understand statewide GIS data availability and existing methods of accessing and distributing available data.
- Identify and understand collaborations between various state, federal and local government agencies regarding GIT endeavors.

Appendix C list the details of individual participants and committees present in the workshops conducted over two days.

3.4 Document Preparation Process

During the two workshops, user comments were documented and synthesized into business areas. They were further analyzed to develop the following topics in order to meet the State's business needs:

- Goals and Objectives
- Current Situation in New Mexico
- Programmatic Requirements
- Recommendations for Statewide GIT Endeavors, Including Geographic Information Coordination Efforts

4. CURRENT SCENARIO ASSESSMENT

This section describes the following:

- GIS Technology – Role and Importance
- History of GIS Coordination in New Mexico
- Present Situation Analysis

4.1 GIS Technology – Role and Importance

Geography is a discipline with significant financial, practical, and logistical implications for government and business. Almost all actions taken daily anywhere on the earth have a geographic component (i.e. an exact location). Locational information can be determined and stored to form the basis of geographic data. Many other key features and attributes also can be determined to define completeness and accuracy of such data in a GIS. Since the inception of GIS, many individuals and knowledge-gathering entities have attempted to define GIS. Some state that GIS is a combination of computerized mapping and database information; others maintain it is “an organized collection of computer hardware, software, geographic data, and personnel designed to efficiently capture, store, update, manipulate, analyze, and display all forms of geographically referenced information" (from "Understanding GIS - The ARC/INFO Method, ESRI 1991).

The GSP team (producers of this document with members of the geospatial community who are contributing to this effort) tends to work with an understanding of GIS that incorporates aspects from both of the above definitions. The key concept that distinguishes GIS from other information systems is that GIS maintains a spatial component. A conventional database does not contain location relationships; it might reveal substantial information regarding an event or a place without locational relationships. Thus, an *aspatial* database is unable to handle spatial relationships among data and locational intelligence for relative analysis. Unfortunately, geographic information is often seen as just a map product – a complete misunderstanding of its nature and uses. The primary functions of GIS are spatial analysis, management, and manipulation of data. As explained above, the results of spatial analysis and queries do not always require the use of maps in order to be useful. Maps are often merely a means of visualizing or visually presenting the results.

Government agencies at various levels in New Mexico are using GIS tools and geographic information for diverse applications (e.g., property assessment, legislative reapportionment, socio-economic development, transportation planning, emergency response, water rights regulation and engineering, tax levy, environmental protection, and modeling, natural resource management, and property appraisal.) The large volume of geographic information used by various agencies on a daily basis, combined with the fact that most problems cross one or more jurisdictional or departmental boundaries, makes geographic data an indispensable asset. Thus, GIS becomes the most valuable and vital tool for managing assets and making decisions.

Making decisions based on the analysis of information is a fundamental aspect of government. Policy makers, legislators, and administrators need GIS tools when making strategic decisions. GIS technologies and the use of geographic location as a common key enable managers and users of geographic information to achieve high levels of information integration, to perform complex analyses quickly and efficiently, and to make better decisions when solving difficult problems.

Geographic data and tools comprise a valuable resource that is becoming widely recognized as a critical asset. Geographic data and GIS technology are vital for formulating responses to many the biggest challenges facing states and the nation. GIS is well established as an effective decision support tool that enhances a state's ability to reach the following major objectives:

- Analyzing geographic trends and patterns.
- Managing assets such as utilities, infrastructure, and natural resources.
- Forming a basis for planning, operations, and decision-making.
- Managing map services and data inventory for SSDI and NSDI.
- Supporting national programs, such as homeland security, environmental protection, and resource management.
- Planning and deploying local and statewide emergency response missions.

4.2 History of GIS Coordination in New Mexico

GIS has matured considerably in New Mexico over the last two decades, providing new ways of analyzing and presenting information. It has helped automate cartography; more importantly, it has enabled geoprocessing, spatial analysis, and thematic map comparison. From expensive graphic workstations on mainframe computers to compact handheld systems, GIS has come a long way – and so has New Mexico in its GIT efforts.

In 1984, the NMGIC was established as an ad hoc organization of GIS users. This was followed in 1987 by New Mexico Executive Order 87-19, which officially recognized the NMGIC.

The Resource Geographic Information System (RGIS) assessment project was initiated in 1988 and the RGIS team was formed at the University of New Mexico soon thereafter (RGIS is a program within EDAC). In 1989, the first stage of RGIS was implemented as the New Mexico Legislature funded the RGIS Program. Initially funded at approximately $250,000 per year, the RGIS Program, although called upon to provide ever-increasing services, had to take annual funding cuts beginning in 1994. The funds allocated for the past three years are as follows:

2005 – 2006: $127,800

2006 – 2007: $133,300

2007 – 2008: $140,400

Also in 1989, the Information Systems Council (ISC) formed a GIS Task Force to study GIS activities in the New Mexico state government. As a result, in 1990 the ISC GIS Task Force published a GIS position paper, giving recommendations to the ISC that included the formation of a group dedicated to guiding GIS activities in state government agencies. A position at the General Services Department was identified to coordinate the effort, and a memorandum of understanding between NMGIC, EDAC, and the GAC was signed.

In January of 1991, the Geographic Information Systems Advisory Committee (GISAC, the precursor to today's Geospatial Advisory Committee - GAC) held its first meeting; there were 21 attendees representing 16 state agencies (GISAC became GAC in February 2005.) In the early days, GAC achieved a number of successes, including promulgating guidelines on GIS standards, driving a project to acquire digital raster graphics, and establishing price agreements with vendors. While participation and activities remained at a high level for several years, GAC had become largely inactive by the late 1990s.

The Information Technology Management Office (ITMO) and the state's new Chief Information Officer (CIO) position were created in 1999. The Information Technology Commission (ITC) held an initial meeting on May 20th, 1999. A profile of the state's GIS coordinating infrastructure was published in June 1999. In July 1999, the ITC began to address the inactive GAC status by forming a GIS Task Force that met throughout the summer of 1999. The GIS Task Force recommended that the GAC be revived as a standing subcommittee of the ITC. On October 13, 1999, the newly reconstituted GAC began convening monthly meetings. Representatives from 26 state agencies or organizations have been attending, along with participants from several New Mexico counties and cities.

One of GAC's first orders of business was to draft the GAC Charter. The GAC Charter, available online at http://cio.state.nm.us/GAC_charter.pdf, was approved by the ITC on January 11, 2000. The Charter incorporates the recommendations and objectives of the ITC GIS Task Force and lays out the administrative structure of GAC. The GAC Charter is reviewed and updated every year. A Charter Working Group will be formed in August 2007. The first order of business is to expand the charter voting membership to be more inclusive.

GAC, as it is currently formed, provides for voting representatives from the following entities:

- All New Mexico state government departments, agencies, and organizations;
- Earth Data Analysis Center (EDAC);
- The New Mexico Geographic Information Council (NMGIC);
- The New Mexico Association of Counties (NMAC)
- The New Mexico Municipal League (NMML).

In addition, a representative from the CIO/ITMO serves in a non-voting advisory capacity. As all GAC meetings are public meetings, GAC has encouraged attendance and participation from all sectors.

A milestone for GAC was the creation of the Geospatial Data Acquisition Coordination Committee (GDACC), implemented by Executive Order No. 2003-018, signed May 27, 2003 by

Governor Bill Richardson. The GDACC includes representatives from GAC, NMGIC, EDAC, local governments, and the geospatial community at large; along with non-voting advisory members. GDACC's responsibilities include representing the State's mapping priorities and requirements; assessing, prioritizing, and requesting aerial and mapping data; coordinating aerial and mapping needs with New Mexico congressional delegations; and identifying funding sources. GAC members also participated in conferences and/or activities organized under the auspices of the Western Governors' Association Geographic Information Council (WGA GIC) and the NSGIC. In 2005, the GIS Advisory Committee was renamed the Geospatial Advisory Committee to the Office of the Chief Information Officer.

Subsequently, additional Executive Orders were issued (Executive Orders 2007-005 & 2007-006) to establish the Local Level E911 Advisory Council and the State E911 Coordinating Committee. These executive orders were the direct result of April 27, 2006 LFC audit findings that stated local governments and stakeholders in the E911 program had no statewide organization representing their concerns.

Moreover, multiple GIS Coordinator positions internal to various state agencies were created recently (see recent DFA/LGD/E911, TRD, EMNR, and NMED position creations.) These agency coordinators are mandated to pursue agency-specific missions. Currently, there is no vision or plan to organize and streamline the efforts of these coordinators towards statewide enterprise GIT goals.

In summary, GIS technology has matured over time in New Mexico. It has moved and expanded from the hands of highly trained specialists dealing with mainframe technology to user-friendly tools on the desktop and in the field. GIS users can now concentrate less on the technology and processes, and focus more on the outcomes and solutions to problems. This has resulted in GIS being better integrated within programs that need to analyze and provide geographic information. GIT has become an integral part of the decision making and public service process. For example, it is becoming commonplace to find GIT being used at the public counter or front desk of local agencies as a tool for conducting business.

4.3 Present Situation Analysis

4.3.1 NSGIC Guidelines for Statewide GIS Coordination

In 2005, NSGIC conducted a national survey on Statewide GIS Coordination. New Mexico scored low in several key criteria, including the lack of a formal authority that can enter into contracts and effectively coordinate GIT initiatives. In fact, New Mexico fully met only two of NSGIC's nine coordination criteria (per published NSGIC Survey results) as shown in the Table 4-1A.

Table 4-1A: Last NSGIC Survey on Coordination of Geographic Information Technologies

STATE	New Mexico
Paid Coordinator	No
Defined Authority	No
CIO Interest	No
Political Champion	No
NSDI Responsibilities Assigned	Yes
Local Coordination Capability	Yes
Sustainable Funding	No
Contractual Authority	No
Federal Interaction through Council	No

There is some level of "Local Coordination Capability" in New Mexico. However, these activities are sporadically provided through voluntary workers from various agencies and GIT operations within the state. Other technological or institutional limitations include non-participation by key agencies, participation that fluctuates depending on current workload and level of interest, lack of coordinated high-level support for NMGIC, GAC, and statewide GIT initiatives. Formal effective coordination is lacking. More accurately, New Mexico met only one of the NSGIC's nine coordination criteria as shown in Table 4-1B) below.

Table 4-1B: Coordination of Geographic Information Technologies in New Mexico

STATE	New Mexico
Paid Coordinator	No
Defined Authority	No
CIO Interest	No
Political Champion	No
NSDI Responsibilities Assigned	Yes
Local Coordination Capability	**NO**
Sustainable Funding	No
Contractual Authority	No
Federal Interaction through Council	No

4.3.2 Negative Impacts on Citizens due to Absence of Statewide GIT Coordination

The lack of designated authority for statewide GIT coordination results in:

- Inadequate governance and oversight for agencies/ departments that are implementing enterprise GIT across the state.
- Increased software procurement expenses and redundant data acquisition.

- Poor utilization of scarce resources.
- System failures and/or cost overruns when not considering an integrated GIT solution. Proper consideration of GIT as a decision support system within larger IT systems will save significant costs and improve work efficiency.
- Insufficient policy promulgation, contract negotiations, and standards maintenance.
- Missed opportunities through funded grants that could have been pursued, and were not due to a lack of an enterprise-approach philosophy to GIT activities.
- Isolated projects/events that do not yield universal benefits, and lead to redundancy and duplication of efforts in data and application development.
- Impairment of several rural areas, cities, and counties with limited funding to access GIS data available to them.
- Local agencies being required to produce and maintain datasets without adequate funding. This is specially noted in local governance for property ownership and transportation data (NMSA 1978 Sections 7-38-9 and 63-9D-4D).
- Overextended workforce through volunteerism.

The benefits of GIS coordination can result in significant benefits that well exceed the cost. For example, the Decennial Census undercounted the population of New Mexico in 1990 and 2000. These undercounts reverberated throughout the entire decade via the annual population estimates that are produced by the Census Bureau in the years following the Decennial Census. According to PricewaterhouseCoopers' accounting report, the Census 2000 undercount will cost New Mexico in excess of $100 million from the year 2002 to 2012 (see the attached letter from "Bureau of Business and Economic Research"). Effective use of GIT is required to ensure that future census counts are accurate.

Another example is the development of cooperative agreements for grants with federal agencies such as the U.S. Geological Survey (USGS). If New Mexico does not receive federal grants, the state cannot achieve overarching goals to maintain NHD data, maintain GCDB datasets, perform Height Modernization projects, as well as acquire statewide aerial imagery.

4.3.3 Existing Organization Structure

Figure 6 depicts the existing organization structure. There are two tiers of existing committees:

- Tier I – GAC, involving advisory teams for goals, vision, and policy definitions. In turn, there are two types of participants attached to GAC:
    - Voting Participants – state agencies, EDAC, NMGIC, NMAC, NMML
    - Non-voting Participants – federal and local agencies, private sectors, GDACC
- Tier II – Working Groups involving technical support and implementation teams. They provide valuable inputs and action recommendations to the GAC for success of GIT programs within the state.

The GAC reports to the OCIO for all GIT operations; the OCIO in turn reports to the governor. There are state IT agencies (ITC, IT Council) that advise the OCIO on IT related issues.

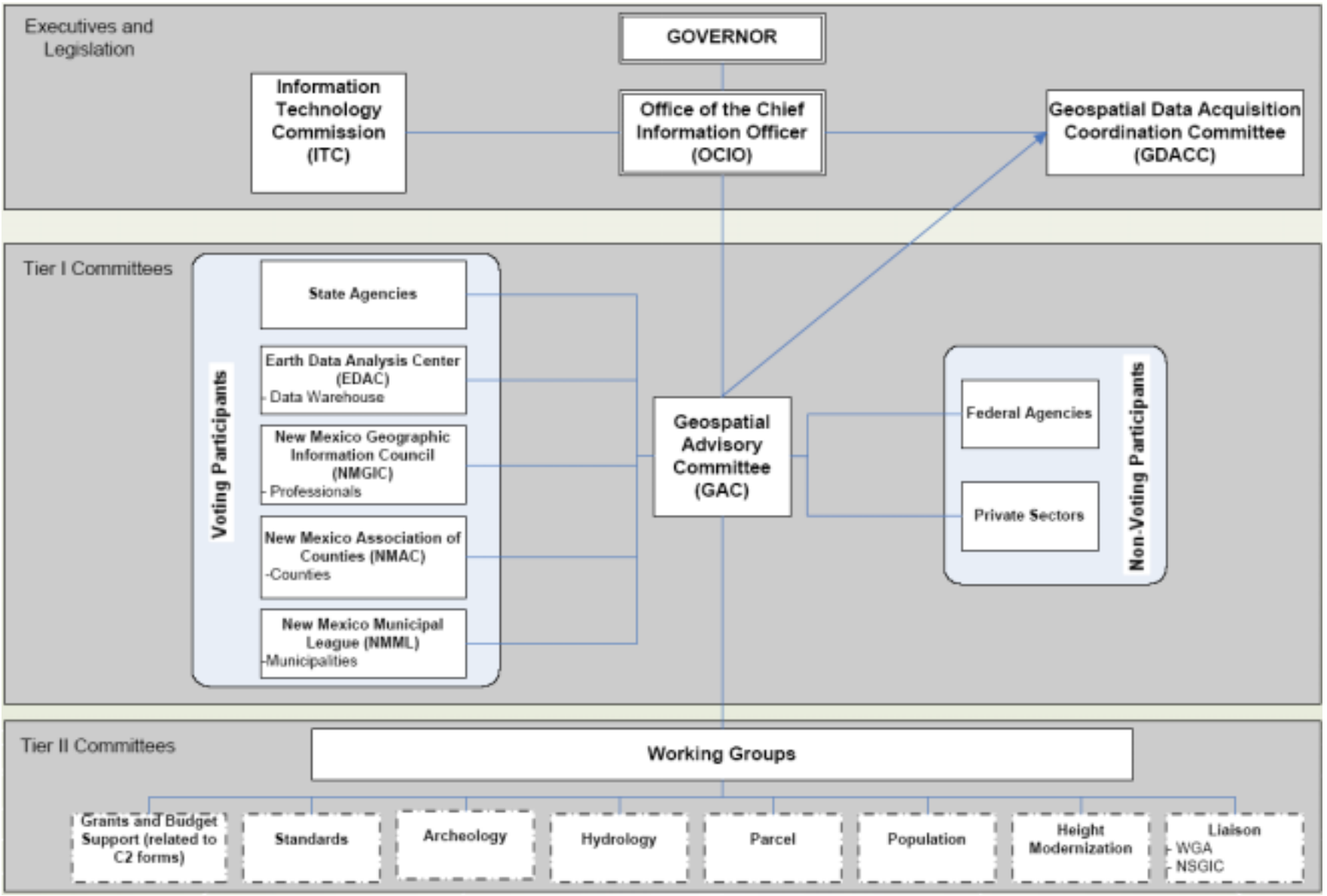


Figure 6 – Existing State GIS Organization Structure

4.3.4 Existing GIS Clearinghouse

EDAC maintains the Resource Geographic Information System (RGIS) clearinghouse with GIS data and imagery for the past 15 years at the University of New Mexico (UNM). This effort faces numerous limitations:

- The present clearinghouse is a cold fusion based web page that hosts metadata and spatial data. There are limited services for text searches and ftp downloading of spatial data. All data are available to the public free of charge.
- Current levels of funding do not support the clearinghouse as a state GIS portal.
- Complete datasets with metadata are required for SSDI, NSDI and GOS compliance and contribution.
- Metadata have been developed, yet Federal Geographic Data Committee (FGDC) standards cannot be implemented nor updated consistently due to limited resources.
- The existing portal is not sufficiently sophisticated to search, retrieve, download, and archive customized data, applications, and Web services.
- The data distribution system is not a Web-based map portal; such a portal would have to be designed and deployed.
- Existing staff resources cannot support the existing needs for data and services.
- The GIS clearinghouse is an excellent asset and resource for the public. The RGIS ftp website is nationally recognized and heavily used. The yearly report statistics state that 1.22GB of data are downloaded daily. Yet, there is no strategic direction for the clearinghouse that ideally would come from a higher authority (e.g., the Office of the GIO).

4.3.5 Current Limitations and Challenges

The evidence from the above findings illustrates that although New Mexico is doing well in many voluntary GIT efforts and GIT projects, the state is lagging behind in many ways regarding geographic information coordination. This demands immediate attention at the state level. Coordination has occurred through the Office of the State Engineer (OSE), GAC, EDAC, NMGIC and GDACC, along with valuable contributions from many state agencies, but the volunteer nature of the coordinative efforts is inherently limiting. The limitations and challenges for statewide GIS coordination in New Mexico that must be overcome are as follows:

- Inadequate statewide GIS coordination, governance and management.
- Non-existent funding support.
- Insufficient staff capacity and staff training.
- Voluntary engagements of workers for GIT efforts.
- Lack of a political champion, limited sponsorship from legislative engagements, and inadequate political outreach.

- Insufficient understanding by many policy makers regarding the uses of GIS technology and the fundamental importance of location for decision making.
- Lack of adequate, agreed upon standards addressing geographic data content, format, and compatibility.
- Lack of good data models and application framework agreements for collaboration and data sharing, particularly across organizational boundaries and policy areas.
- Limited use of GIT to manage geographic information for socio-economic purposes.
- Limited use of metadata to document data sets as they have been created over the years.
- Lack of metrics related to the costs and benefits of GIT use.
- Outdated statutes related to data privacy, public access to data, and liability for data (e.g., state agencies are allowed to restrict access and charge royalties for database copies).

5. GOALS AND OBJECTIVES

This section describes the following GIT goals and objectives:

- New Mexico's GIT Goals
- New Mexico's Programmatic Objectives to Satisfy Identified Goals

5.1 New Mexico's GIT Goals

New Mexico's strategic goals for geographic information management and coordination will encompass the proliferation and importance of GIT projects and systems at all levels of government and industry within the state. After detailed analysis of expressed needs and considerable discussion with the Strategic Planning Committee, GAC, EDAC, and other stakeholders; the State's needs and objectives were identified. The analysis also included an examination of the history of GIS and of prevailing conditions within the State. The defined needs and objectives also were compared with NSGIC guidelines for further refinement.

New Mexico's goals for geographic information coordination, governance, and management are to:

1. Coordinate and manage GIT activities across various agencies within the state.
2. Identify multiple and sustainable funding sources for statewide GIT activities.
3. Ensure legislative sponsorship and endorsement for the cause of GIT and coordination efforts within the state.
4. Provide an organized framework to enable data integration and sharing of both spatial and aspatial applications and information, thus contributing towards SSDI and NSDI.
5. Raise the awareness and knowledge of politicians, legislative bodies and councils, citizens, and businesses within the state about the uses and benefits of all geospatial technologies.
6. Leverage the human, technical, and informational resources of the geographic information community to accomplish measurable statewide goals and local objectives.
7. Facilitate the integration of geospatial technology and the broader realm of information technology.
8. Spread the benefits of geographic information and geospatial technology broadly and equitably to improve overall quality of life, the environment, and to solve business problems.
9. Prevent and/or discourage misuse or abuse of public data.

5.2 State's GIT Programmatic Objectives to Satisfy Identified Goals

The state's primary objective is to establish the necessary organizational framework for coordinating the ongoing development of GIS technology within all agencies across the state to

maximize the benefits derived from investments in GIS data and technology. Coordination of GIT efforts and management of geographic information will facilitate the development of governmental assets and prepare a strong foundation for any functions that benefit from their use. Various other government databases can be linked to GIS applications and databases to achieve governmental objectives. The key benefits derived from statewide GIS coordination are:

- Maximum leveraging of geographic information assets throughout the enterprise.
- Ability to share geographic information easily and quickly between agencies and organizations through central clearinghouse.
- Integration of maps and geographic data with related tabular databases.
- Maintenance of geographic information in accordance with accepted standards and quality commensurate with the latest technology.
- Capability to perform higher-level (macro or inclusive) environmental analysis and modeling.
- Managing information using an enterprise-approach philosophy, including ensuring timely availability of maps with related data and/or analysis results.
- Use of technology to better serve the people and government of New Mexico.

The following four programmatic objectives are identified as the major objectives for the state's GIS strategic plan, keeping in view the strategic goals of the state and key benefits (as stated above).

- Creation of Geographic Information Office (GIO).
- Enhancement of the existing State GIS Clearinghouse.
- Creation of GIS Service Provider.
- Creation of an Environment Where GIS Technology is Available to Everyone.

Each of these programmatic objectives is discussed in more detail in the next section.

6 PROGRAMMATIC REQUIREMENTS

In the previous section, the state's geographic information coordination and management goals were distilled into four programmatic objectives. In this section, each of the programmatic objectives is defined in terms of general requirements. Proper understanding of the programmatic requirements of each objective provides a basis for developing the recommendations for each.

6.1 Creation of Geographic Information Office (GIO)

This programmatic requirement will support the following:

- Coordinating geographic information technology development statewide.
- Promoting the perception of geographic information as a critical information asset and managing the information from enterprise-approach philosophy.
- Coordinating, governing and streamlining the efforts of all GIS Coordinators in various state agencies towards a common goal (statewide).
- Pursuing funds and grants to fuel GIT efforts.
- Pursuing base funding to support and expand the GIO as needed.
- Promoting partnerships and collaboration to develop and use GIS data and applications.
- Promoting and demonstrating GIT to the legislative bodies, politicians, and top managers.
- Developing policies and standards for data, metadata, applications, maintenance procedures, data quality, and data update frequencies.
- Addressing legal and policy issues regarding geographic data distribution.

6.2 Development of the State GIT Clearinghouse

This programmatic requirement will support the following:

- Improving and hosting complete framework data for SSDI.
- Enabling integration of non-framework geographic data within the state.
- Improving the contribution of data to NSDI, National Map, and the GOS Portal.
- Strengthening the enforcement of FGDC metadata standards and data quality.
- Assisting in the establishment of data stewardship programs for data maintenance.
- Facilitating easy spatial data access and sharing using metadata portal searches.

6.3 Creation of GIS Service Provider

This programmatic requirement will support the following:

- Revamping and enhancing existing workgroups, councils, and advisory committees to work in tandem with the GIO.

- Providing advice and support to any GIT effort (as needed) within the state through the GIO Office.
- Provisioning of both focused and ad hoc GIS services for geographic data development and consumption.

6.4 Creation of an environment where GIS Technology is available to everyone

This programmatic requirement will support the following:

- Promoting broader use of geographic data and information.
- Creating sufficient value-add from GIT resulting in politicians, legislative bodies, managers, and agencies appreciating and understanding the need and importance of GIT.

7. STRATEGIC RECOMMENDATIONS

This section describes six strategic recommendations for New Mexico to implement the identified programmatic requirements. The recommendations set forth in this section are intended to support the programmatic objectives identified in Section 6. However, these recommendations will be ineffective unless they are sustained and implemented by state leadership, including political bodies and the legislature. Following are the recommendations to support the programmatic requirements.

7.1 Geographic Information Officer (GIO)

Current Issue

Some individuals devote voluntary time towards statewide GIS coordination efforts, in an effort to support the cause of geographic information management and coordination. However, these efforts are insufficient in many cases. New Mexico does not have a full-time, paid GIO position with designated authority to coordinate efforts and resources in the state's best interest.

Recommendations

- Establish a state-funded, full-time GIO position immediately and urgently through an executive order or legislative mandate. This position is intended to lead all statewide GIT efforts and geographic information coordination rather than interfere with individual agency missions and business processes. This position should report to the state CIO and work closely with the CIO office to interface between the GIS community and state legislature; the GIO office structure should be consistent with the Coordination Criteria for Statewide Coordination developed by NSGIC:
    - **Governance** — Coordinate and govern all GIT efforts across the state.
    - **Set Policy** — Develop guidelines, policies, and standards for data and interoperability, coordination and operations management, purchases, projects, data, applications, standards that ensure availability, and integration of spatial data from multiple sources.
    - **Recommend** — Establish and/or enhance the GIS Coordinating Council and GIS advisory groups that define goals and recommends action.
    - **Implement** — Establish and/or enhance GIS working committees for implementation and technical support for the State's Spatial Data Infrastructure; fund and support the GIS clearinghouse for national map and NSDI contribution.
- Figure 7 illustrates the recommended organization structure.

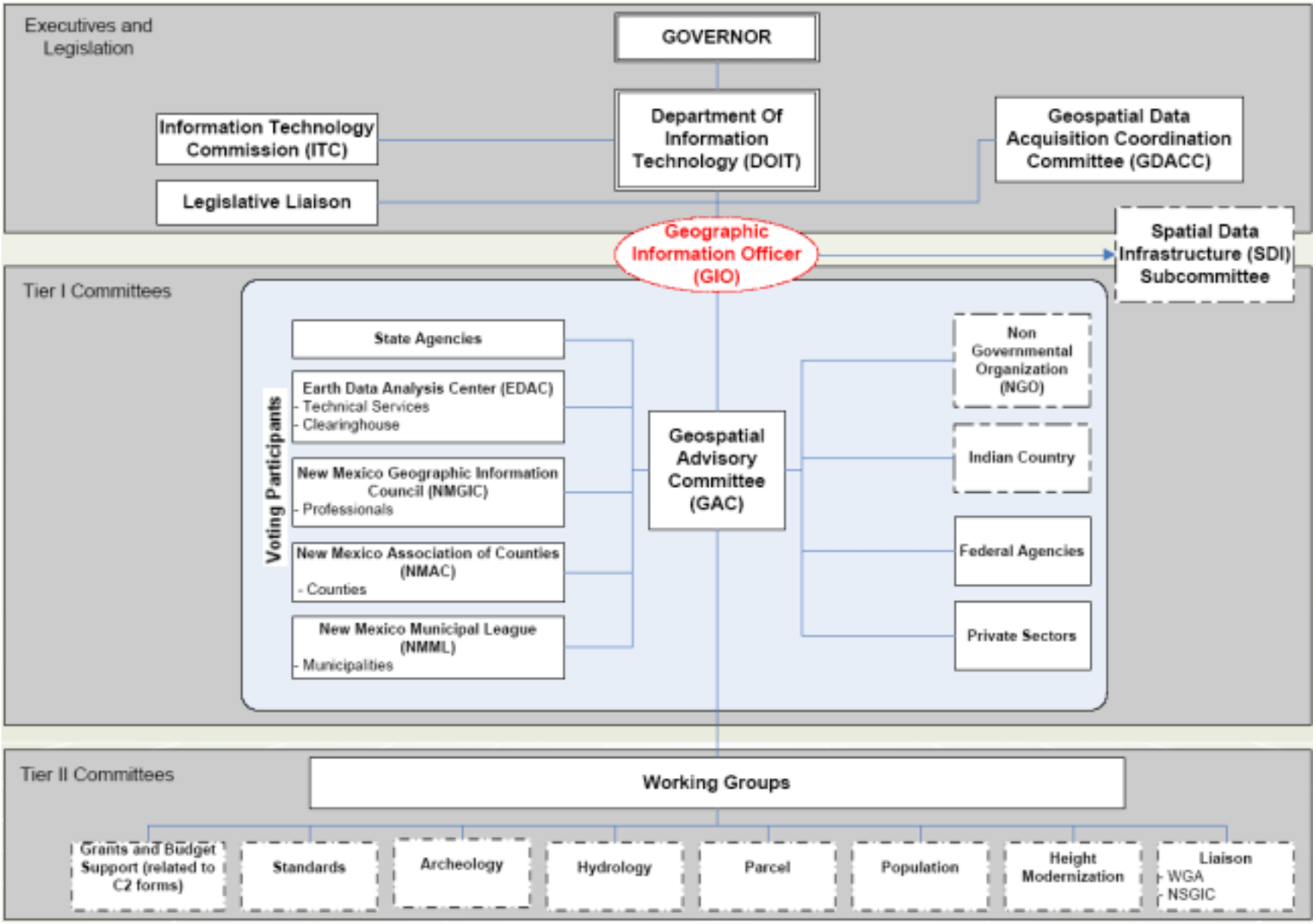


Figure 7 – Recommended State GIS Organization Structure

The major changes recommended in the organizational structure are discussed below:

  - The GIO Position should be created under the DOIT.
  - The DOIT is already slated to be formed and will include the OCIO. Moreover, some other IT entities like Information Services Department (ISD) and Telecommunication will also be included within DOIT.
  - Representatives from political and legislative bodies will be included.
  - Remove the "Standards Team" from Tier II Committee and add that team to the IT Council that assists DOIT and reports to Legislature. It makes sense for the "Standards Team" to operate under the IT Council to make informed decisions about GIT standards.
  - Include private sectors, and federal agencies as voting participants for the GAC.
  - Form a new SDI subcommittee with a total of 10 members from the Tier I and Tier II committees. Their focus will be to help with SSDI and NSDI framework layers development with respect to standards, coverage, layers definitions, completeness, accuracy, metadata, and GOS compatibility.
  - Update the state GIS clearinghouse/metadata portal and web-based map portal by using and enhancing the infrastructure and resources of RGIS at EDAC.

- Provide the GIO with the infrastructure and authority (both administrative and budgetary) to negotiate statewide GIT purchases of services, data, software, and relevant GIS technology and engage in agreements and partnerships to benefit the state; signatory rights and oversight of GIT related grants and joint funding opportunities to provide unified procurement and contract management of GIS software and services. The GIO will coordinate all capital purchases (e.g., statewide software licensing, hardware) through the OCIO for the following two reasons:
  - The IT body of knowledge is represented through the OCIO; and
  - Economies of scale - large statewide purchasing option will drive down the cost per license.
- Establish qualifications for the GIO that ensure in-depth knowledge of GIT projects and requirements within New Mexico.
- Provide at least $850,000 per year as base funding to sustain the position and project activities. The GIO Office will be tasked to leverage these funds through coordinated pursuit of projects, funds, and proposals. This budgetary figure is determined by analyzing the results of the Benchmarking Study (see Appendix A) that present the operational budget for other similar states. The breakdown of the budget is as follows:
  - Provide $150,000 towards GIO salary, benefits, travel, conferences, and other incidentals.
  - Provide $400,000 towards enhancement of the state GIS clearinghouse and Web-based information distribution.
  - Provide $300,000 towards statewide GIT projects and services.

- Create an "open and revolving" fund that will enable the GIO to leverage funds across multiple fiscal years. Some of methods of accomplishing this include:
    - Securing funding at the state level through all sources including general funds.
    - Pursuing funding opportunities with federal agencies. Various federal agencies (e.g., USFS, USGS, USFWS, BOR, BLM, USACE) together account for over 40% of the land holdings within the state. The relationships with those federal agencies must be explored in greater detail to secure appropriate grants and funds, keeping in view their stakes within the state.
    - Looking for grants from federal agencies like USGS for statewide programs like image acquisition.
    - Securing funds on a project-to-project basis from government agencies to build decision making systems utilizing GIT to support state or national programmatic goals (e.g., homeland security, census, cross-border immigration issues, and water rights issues.)

Intended Benefits

- The GIO will positively impact the state's enterprise-approach philosophy for GIT and enhance operational efficiency in the following ways:
    - An overall perspective on the state's needs and a central point of contact and authority to make decisions on behalf of the state will decrease redundancy and unify efforts.
    - This central authority will address statewide GIT concerns through coordination of long-range plans that includes state, local, tribal and federal governments. Executive Orders (2007-005 & 2007-006) refer to this issue (see Section 4.2).
    - Coordinate the efforts of internal GIS coordinators within various state agencies, streamline their efforts (agency specific missions) to involve with local governments and relevant stakeholders within the state, and build towards the statewide enterprise GIT architecture.
- The GIO will represent the state at the national level and promote coordinated GIT work being done within the state. This will eventually bring more federal and national funding.
- The impact of improved coordination will be far-reaching and will include tangible benefits (e.g., saving of money, prompt response times to emergency and crisis situations) as well as intangible benefits (e.g., improvement of citizen engagement, protecting of natural resources). It is important to invest in a GIO position to reduce cost by eliminating redundancy, duplication, and mismanagement so that statewide GIT efforts are coordinated intelligently, thus improving the oversight and workflow in statewide projects.
- Coordination streamlines the procurement process significantly by cutting costs through economies of scale for software licensing and data acquisition, thus enabling partners to upgrade technology in a cost-effective way. Most agencies will benefit from GIS coordination, including:

  - Agencies with successful GIT programs - There is a need to retain control over their projects, specific areas of responsibility, and expertise. A GIO having fiscal resources will provide these agencies additional support, and will collaborate in their data needs and acquisitions, standards development, and other supporting roles.
  - Agencies with limited GIT capabilities - The GIO can provide funding and access necessary technical support, services, and expertise.
  - Agencies with no GIT capabilities - The GIO will provide a wide range of support services and funds to develop their programs.
- The GIO will encourage seamless (edge-matched) data that creates continuous and consistent data layers across county boundaries. This creates a common "look and feel" across jurisdictions and reduces analytical costs. Standardized inspection methods across the state ensure reliability, quality, accuracy, completeness of data, and eliminate redundancy.
- Federal entities, emergency management, and disaster recovery officials can trust that they have the latest information throughout the state. Regular reporting of latest developments and planning within the state will ensure that agencies receive appropriate federal funding, thereby adding value to state and national programs.
- The GIO will provide a forum for technology transfer, best practices, and program guidance and access to GIT capabilities for stakeholders lacking adequate resources, fostering the growth and development of new GIT activities across all agencies within the State.

7.2 Acquiring Management Support and Sponsorship

Issue

The State's geographic information coordination efforts have had some sporadic support from various offices at different times. However, there is no identified champion within the state. A champion from the political/legislative body is absolutely required for the success of GIT programs across the state.

Recommendations

- New Mexico needs to identify a champion within the legislative body having financial/ budgetary powers and preferably having influence with the governor's office. It is more important to have a highly regarded and respected person as champion rather than a vocal person.
- Support from the CIO and the governor is mandatory.
- Data acquisition coordination is a major effort that saves money through GIO coordination. This idea will be used to obtain management buy-in.
- Identify and cultivate the support of additional champions in key agencies (e.g., USGS, water, energy, state engineer's office, state lands office, association of counties).

- Identify and cultivate the support of a champion (member of congress or lobbyist) in Washington, D.C. who will look out for the state's interest in terms of federal projects and grants.
- Promote GIT to the top officials in state's management and legislature:
    - Use one-page flyers describing GIT issues that require the state's attention (e.g., forest fires, protection and preservation of natural resources, cadastral maps, homeland security, height modernization, global warming).
    - Use power words and phrases with key people when promoting GIT (e.g., information security, public safety, emergency response, disaster response and disaster recovery, socio-economic opportunity, water and energy, border management/immigration issues, *colonias*, natural resources).
    - Additional promotional ideas are stated in Appendix A (Benchmarking Study – Section 4.5. 4.6).
- Appoint internal and/or external consultants to help develop the GIT promotion plan:
    - Develop a slogan (a memorable motto or phrase used as a repetitive expression of an idea, purpose, product, or program) and a tagline (a memorable phrase that will sum up the tone and premise of the idea or purpose to reinforce the reader's (listener's) memory of the program).
    - Design and develop tools for promoting GIT (e.g., GIT 101 Workshops with executives, GIT flyers).
    - Team up with the GIO, NMGIC and GAC while promoting GIT to political and legislative levels.

Benefits

- The State will benefit from political and legislative participation in terms of vision, support, and funding for statewide GIT program.

7.3 GIS Councils and Committees

Issue

NMGIC, GDACC, GAC, NMAC GIS Affiliate, and the E911 Committees are currently serving as GIS committees within New Mexico. Also, some "working groups" exist in the form of small subcommittees under the direction of GAC. They provide forums for discussing GIT activities within the state and maintain ad hoc coordination. However, the members of these bodies do not include political champions or policy makers. They represent the technical GIS community not sanctioned by executive order. They are neither empowered with funding nor with the authority to make binding decisions.

Recommendations

- Members from legislative bodies and political influence will play a role in these committees as explained in Section 7.1. Preferably, this should be defined in an executive order.

- Representation from appropriate stakeholders and GIS community will be homogeneous across the state.
- SDI Subcommittee – Some members from the above tiers will come together to form the SDI subcommittee. Representation from both data stewards and data consumers is recommended. The sole focus will be to develop and deliver the SSDI and NSDI framework layers. This committee will advise the GIO and state GIS clearinghouse regarding framework data.
- Committee team sizes will be optimized. Each committee will be large enough to encompass all ideas and small enough to channel focused thoughts and implementations. Unnecessarily large teams hamper efficiency and effectiveness.
- All committees will work closely with the GIO Office.
- Add SDI Subcommittee as explained in Section 7.1.
- Appoint external consultants to help GIO, NMGIC, GAC develop the business plan for forming the Tier II and SDI sub-committees:
    - Forming the committees by helping the state select the members.
    - Defining the roles and goals for the committees.
    - Advising each committee on its goals and implementation plans.

Benefits

- The State will benefit from overall statewide representation, broader issues and goals, and cross-organizational fertilization.
- Representation from all levels of industry that use GIT with multiple disciplines, policy makers, politics, and technical user groups will ensure a variety of thinking and implementation tactics. Moreover, it will open the vast contact network that will be help to achieve the state's GIT strategic goals.

7.4 State GIS Clearinghouse

Issue

Earth Data Analysis Center (EDAC) at the University of New Mexico (UNM) has been developing, maintaining, and growing SSDI infrastructure and NSDI framework layers for over 15 years while managing the state clearinghouse, RGIS. However, EDAC funding is inadequate to develop and support a formal centralized GIS clearinghouse for the state.

Recommendation

- Designate and fund EDAC ($400,000 annually) to build into a formal State GIS Clearinghouse. The clearinghouse will host the state enterprise GIS portal (including appropriate spatial data) for SSDI layers and acting as the main contributor towards the NSDI and GOS efforts. The web-based metadata portal will be able to search, retrieve, store, archive data, applications, and web services (e.g., a geocoding web service that can be accessed and used by state/local agencies and the public).

- The $400,000 funding is in addition to other funds that EDAC already received from other sources. Utilization of this fund is focused on clearinghouse infrastructure, metadata portal development, web-based mapping and specialized services.
- All common datasets (e.g., imagery) will be hosted and served using web-based access and download tools through this metadata portal. This service will eliminate redundant data hosting for several state and federal agencies.
- Provide EDAC with funding support for infrastructure, software, hardware, and additional resources as needed through the GIO office. This funding support will help EDAC to provide specialized services (e.g., provide mapping, project, or technical support or coordinate pilot and prototype projects) to the GIS community within the state.
- EDAC participate with the GIO and SDI subcommittee (see following bullet recommendation) to define and implement the elements of an effective SSDI - catalog framework layers, complete metadata (following FGDC guidelines), and guide routine updating and frequency of maintenance procedures with participating data stewards.
- Foster partnerships with all participating data stewards and stakeholders to leverage and assimilate their data in order to deliver through the clearinghouse for the State's SSDI and NSDI efforts.
- Establish consistent partnerships with stakeholders for accessing geospatial data and ability to integrate data from disparate agencies to create a unified view of government performance.
- EDAC may provide technical support, training, guidance, and technology transfer services to the state's GIS community where requested.
- As current policy all data will be provided free of cost through the GIS clearinghouse.
- Appoint internal and/or external consultants to work with the different committees and GIO to help develop a business plan for the GIS clearinghouse:
    - GIS framework layer list development for SSDI and NSDI efforts.
    - Define standards for the clearinghouse.
    - Develop and implement the GIS metadata portal for hosting the SSDI layers and making it harvest ready for GOS.

Benefits

- Designating EDAC as the GIS clearinghouse leverages existing, proven resources already at work, without a major learning curve or resource investments.
- Real-time data access enables greater situational awareness and provides timely information, improving decision support technology. Faster, more informed decision making during emergency response enhances preparedness for homeland security.
- Data sharing and security protocols ensure greater sharing among stakeholders and stewards across all levels of government who have in the past sometimes been hesitant to share sensitive information.

- Integration of GIS technology as a core component into the state's business process and mainstream information technology will ensure consideration of GIT in workflows in IT systems; this in turn will save money while delivering efficient applications and data for decision support systems.
- Contribution to the NSDI and GOS Portals highlights the state's efforts at the regional and national level.

7.5 Create Easy Access to Information

Issue

New Mexico State has various map layers served through various agencies. EDAC is now hosting and serving most datasets. However, there is no mapping website to serve out base map layers and SSDI layers.

Recommendations

- New Mexico needs to design, develop, and publish state base maps and SSDI layers through a web-based GIS application. The application must be capable of consuming multiple map services to support multiple map layers from different sources.
- The State will serve the SSDI and NSDI framework layers through this application.
- EDAC will be the hosting and serving agency for data distribution. EDAC will provide appropriate, standards-based (e.g., OGC, ISO, W3C, FGDC, ECMA) interoperable services for data and applications to cater effectively to various agencies within the state. Proper infrastructure and funding support should be provided to EDAC to achieve this goal.
- Some special thematic layers need to be included to enhance the usefulness and attractiveness of the information. These could include education, healthcare, emergency response, and cultural tourism. The goal is to provide content of particular interest to the political and legislative champions.
- Appoint internal and/or external consultants to help develop web-based access:
    - Design and develop the web-based application to consume web services and serve base maps, SSDI, NSDI layers.
    - Install, train and implement the application at EDAC with the aid of EDAC staff.

Benefits

- Data presented in the form of a dynamic web-based map reduces the need for responders to continually convey information across other communication channels (e.g., voice).
- Presentation of data in a map format enables disparate data to be easily integrated and interpreted.

7.6 Develop Business Plans

Issue

New Mexico now possesses a strategic plan. However, business plans need to be developed for each strategic recommendation.

Recommendation

- A business plan for each strategic recommendation (Section 7.1 through 7.5) needs to be developed after the finalization of this GSP.
- Appoint internal and/or external consultants with the responsibility to develop the business plans.

Benefits

- The state will achieve the objectives through the development of the business plans. The business plan will provide the project path to implement each recommendation.
- Developing and implementing the business plan will result in overall progress of the state in the GIT arena as identified in the GSP. Implementation of the strategic recommendations will result in New Mexico enjoying status as a progressive state regarding GIT programs including emergency readiness, homeland security.

7.7 Schedule and Budget

Schedules and costs are estimated for each recommendation. The costs are broken into external (consulting engagement costs) and internal (state employee hours). Figure 8 presents the estimated timeline for each recommendation.

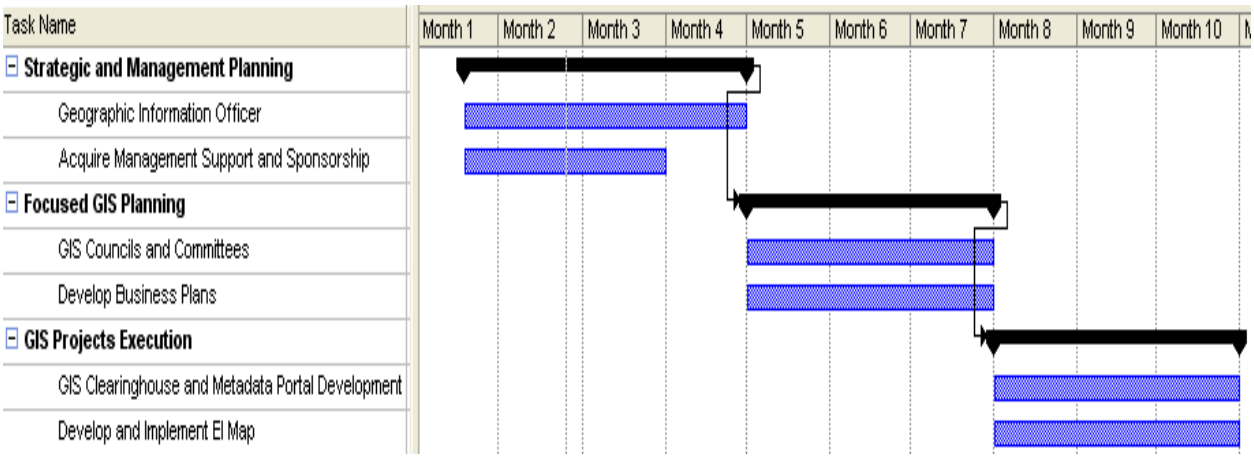


Figure 8 – Estimated Timeline to Implement Recommendations

Table 7-1 presents the estimated annual costs. Adjustments to the cost estimates may be made as needed according to the business plans developed after this GSP.

Table 7-1 – Estimated Annual Costs to Implement Recommendations

Recommendations	Estimated First Year Budget
Establish and Maintain Geographic Information Office	GIO Office Budget:$150,000
Acquire Management Support and Sponsorship	
Establish and Maintain GIS Councils and Committees	GIS Services Budget: $300,000
Develop Business Plans	
Establish and Maintain State GIS Clearinghouse	GIS Clearinghouse Budget: $400,000
Distribute Information via Web-based Media	
TOTAL Budget (Annual)	**$850,000**

APPENDIX A

BENCHMARKING STUDY

Appendix A
Benchmarking Study

For

New Mexico Geospatial Strategic Plan
Phase I

Prepared for:

Roy Soto, Cabinet Secretary
Department of Information Technology
State of New Mexico
Santa Fe, New Mexico

August 10, 2007

Prepared by:

Weston Solutions, Inc.
190 Queen Anne Avenue North, Suite 200
Seattle, Washington 98109-4926
Phone: (206) 521-7600
Fax: (206) 521-7601

WO # 12523.004.001.0002

Table of Contents

List of Figures

List of Tables

List of Attachments

1. Executive Summary

The purpose of this document is to present the findings of the benchmarking study conducted by Weston Solutions, Inc. (WESTON®) on behalf of the New Mexico State Office of the Chief Information Officer (OCIO). The study's objective was to understand the extent and effect of statewide geographic information system (GIS) coordination efforts in other states. The benchmarking effort covers the following topics:

- Maturity, standards, completeness, and effectiveness of statewide GIS efforts per National State Geographic Information Council (NSGIC) guidelines in 18 states.
- Existing GIS Coordination issues within the selected states.
- Organizational structure of the GIS Coordination Office – State GIS Coordination or Geographic Information Office (GIO)/ Geographic Technology Office (GTO).
- Budget, funding sources, and responsibilities of the GIS Coordination Office.
- Statewide GIS data availability and existing methods of accessing and distributing available data.
- Collaborations between various state, federal, and local government agencies with regards to GIS.

Participation in the benchmarking study includes representations of functional and/or official GIS coordinators from the selected 18 states shown in Figure 1 (Participating States). The findings from the benchmarking study (Table 1 through Table 5─State Responses) form the basis of the summary presented in Section 4.

Figure 1─Participating States

The objectives of this document are to:

- Present the findings from the benchmarking study (Tables 1 through 5─State Responses).
- Summarize the GIS coordination findings from interviewed states (Section 4).
- Serve as an integral part (Appendix A) of the New Mexico Geospatial Strategic Plan – Phase One.

Figure 2 (Benchmarking Categories) provides a summary of the results of individual interviews. For example, most of the interviewed states (about 84%) have stewardship towards National Map. The findings are discussed in more detail in the remainder of this document.

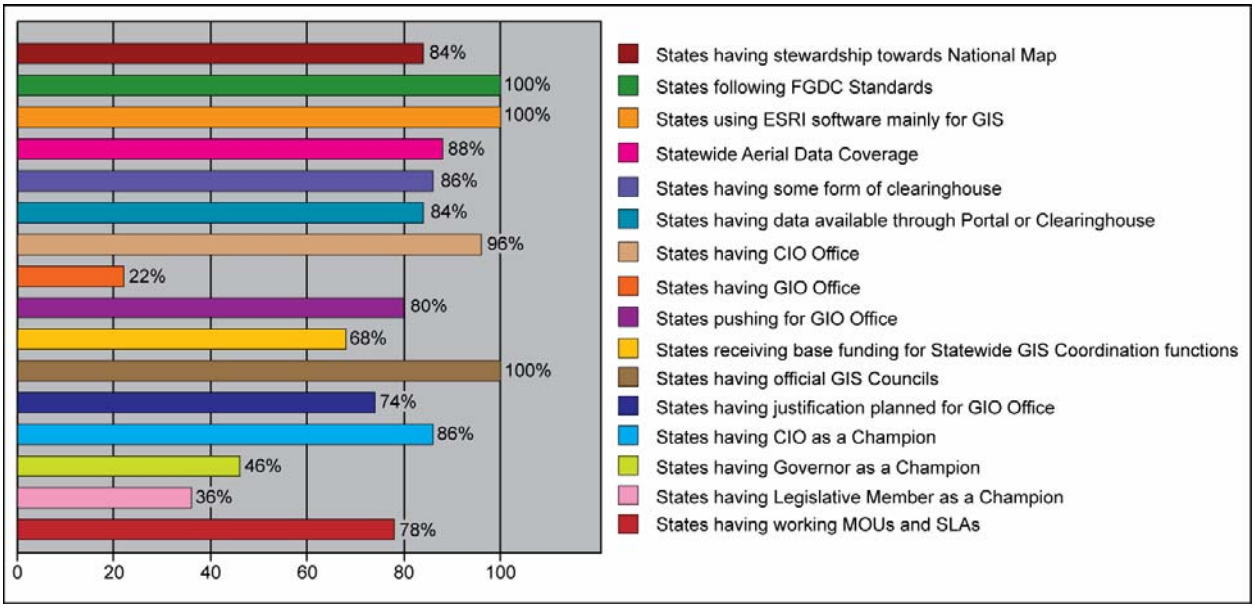


Figure 2—Benchmarking Categories

2. Background

The OCIO hosted a GIS Summit in June 2006 for technical professionals from the entire state to provide a five-year vision for GIS in New Mexico. The consensus of the Summit was the need for a strategic plan that supports government and private requirements, and incorporates opportunities to integrate, collaborate, and consolidate resources. This effort, funded by a federal grant, is the initial phase towards a comprehensive Geospatial Strategic Plan for New Mexico that will provide an inventory with recommendations towards statewide geospatial resources, structure, base map construction, and coordination options.

WESTON was contracted by the State of New Mexico to develop the strategic plan for statewide GIS coordination. This benchmarking study is an integral part of the New Mexico GIS Geospatial Strategic Plan (GSP) and builds on previous work done by the NSGIC.

The telephone interviews were conducted in April and May 2007. The list of people contacted was derived from the list of state contacts provided at the following website: www.nsgic.org. If the primary contacts were unavailable, secondary contacts were interviewed to gather required data for the benchmarking study.

Information on previous survey data compiled by NSGIC can be found at the following website: www.nsgic.org. One of the NSGCIC documents (2005 NSGIC State Summaries) is provided in Attachment 1 of this study, which summarizes geospatial activities and provides contact information for each of the fifty states.

3. Benchmarking Methodology

3.1 Selection Method

After extensive discussion with the State of New Mexico and conforming to NSGIC guidelines, the team decided to choose states primarily on the following basis:

- Some states having formal GIS coordination.
- Some states lacking formal GIS coordination.
- States similar to New Mexico in terms of size, population, and geography.
- States facing similar problems regarding GIS coordination and broad GIS endeavors.

The secondary focus was to cover as many states as possible meeting the primary criteria. Thus, the originally planned six states were expanded to the following 18 states:

Arizona	Iowa	Utah
Arkansas	Maryland	Virginia
California	Montana	Washington
Colorado	Oregon	West Virginia
Delaware	Pennsylvania	Wisconsin
Idaho	Rhode Island	Wyoming

As demonstrated in Section 1, Figure 1 (Participating States), these states are primarily concentrated in the western U.S., but states in the Midwest and east were added to provide more diversity and some special factors relevant to New Mexico. The population of the selected states varied from 37 million to 0.5 million compared to 1.9 million for New Mexico.

3.2 Interviews and Matrix

WESTON designed the matrix (Tables 1 through 5─State Responses) following NSGIC guidelines and scheduled interviews with contacts for each selected state as listed on the NSGIC website. In cases where the contacts could not be reached, WESTON found a secondary contact that had knowledge of the discussion points. All interviews were conducted by telephone. The interviews took more than a month to complete and the findings from the interviews are presented in Table 1 through Table 5.

3.3 Document Preparation Process

During the interviews, each contact's comments were documented and synthesized into key interest areas. The five key interest areas are Statewide Standards; General Statistics; CIO GIO Office Structure; Justification for GIO/ Statewide GIS Coordination; and GIS Clearinghouse/ Service Center.

Statewide Standards

- Development platforms (e.g., .NET, Java)
- Software and hardware
- Data/metadata
- Operating system

- Database
- Any written standards
- What efforts are undertaken towards, National Spatial Data Infrastructure (NSDI), geodata.gov?

General Statistics

- Population
- GIS software and licenses
- GIS data availability
- Number of parcels
- Total road mileage statewide
- Aerial data – coverage and specifications (e.g., scale, resolution)

CIO GIO Office Structure

- Organizational chart.
- Existing or planned CIO, GIO? Successes resulting from creation of this position?
- Number of employees in the State GIS Coordinator/ GIO office, CIO office?
- Operational budgets for state GIS Coordinator/ GIO?
- Is budget base funding, one time, or infrequent lump sum appropriations?
- How are budgets decided and provided? Sources of funding? Any multi-agency collaborative funding?
- Total salaries, GIO salary range?
- Duties, responsibilities, and authorities of state GIS Coordinator/GIO?
- How is coordinating council or advisory committee for GIS structured?
- Upcoming initiatives in GIO/ CIO Office.

Justification for GIO/ Statewide GIS Coordination

- How did you get started? Process, methods, etc. (Forward documentation, if any, e.g., copies of relevant legislation.)
- Who is your internal champion?
- What was the key to promoting GIS within the state? (Forward documentation, if any.)
- Was there any major crisis where the need for statewide GIS or GIO was evident?
- Pitfalls – what were the arguments against statewide GIS effort that you faced?
- Any cost-benefit/return on investment analysis done? Any documentation?

GIS Clearinghouse/ Service Center

- Do you have a centralized or decentralized service center for providing GIS services? (e.g., Department of Transportation, Department of Health Services does its own GIS per department-specific needs; or do you have a centralized GIS team that performs GIS work for all departments/agencies?)
- Is the state supplying GIS data/applications to federal agencies? Or vice versa?
- Data sharing, systems administration – security, Memorandum of Understanding (MOU), Service Level Agreement (SLA)? Legislative implications for sharing sensitive or proprietary data?
- How successful have you been in engaging private sector vendors in data sharing?

The results of the interviews are presented in Section 4. In addition, five tables consisting of the responses from interviewed states on the five key interest areas are attached.

4. Summary of Findings

This section summarizes the findings from the sample population (SP) interviews. These findings are grouped by the key interest areas. Additional findings (Section 4.5, 4.6) as derived from the responses on key interest areas are also summarized and presented here.

The individual state responses are provided in Tables 1 through 5. These tables are grouped by the key interest areas provided in Section 3. The detailed analysis is contained in the strategic plan.

4.1 Statewide Standards

- ESRI software is predominant in all state governments – 100% of the SP uses ESRI as their standardized GIS platform.
- Hardware is procured through multi-year, multi-party vendor agreements – DELL, IBM, HP, Gateway are the brands most frequently used.
- All (100%) of the SP provide their framework dataset following NSDI and Federal Geographic Data Committee (FGDC) specifications.
- All (100%) of the SP follow or try to follow FGDC metadata standards.
- Most (88%) of the SP has aerial data coverage statewide.
- Relational Database Management System (RDBMS) remains variable throughout the states – but predominantly SQL server.

4.2 CIO GIO Office Structure

- Most (96%) of the SP has a CIO office.
- Only some (22%) of the SP has a GIO office.
- Most (80%) of the SP that do not have a GIO office believe that a GIO office is needed and is actively pursuing a GIO office.
- Just over half (68%) of the SP receive some amount of base funding to sustain the operations of a State GIS Coordinator.
- The salary of the GIS Coordination position varies between $60K and $115K, the median being $80K.
- All (100%) of the SP has multiple GIS councils – at least one of them is an advisory committee and at least one other is a technical forum.
- Common upcoming initiatives for statewide GIS coordination are: enterprise architecture deploying Web services, collaborative efforts for statewide data acquisition, and an organized effort to institutionalize State GIS Coordination.

4.3 Justification for Statewide GIS Coordination

- Most (74%) of the SP has some form of justification planned for the GIO or State GIS Coordination position.

- Internal champions vary by state: 86% of the SP that want a GIO office has a CIO as a champion, 46% have the Governor and another champion, and 36% have legislative champions.

4.4 GIS Clearinghouse/ Service Center

- Most states (84%) support the national map through Geospatial One Stop (GOS) Portal harvests by various participating data stewards at the state level.
- Most (84%) of the SP has data available through a Portal or some kind of a clearinghouse. Most of the data is free, depending on the data type and complexity.
- Most (86%) of the SP with a working clearinghouse has centralized hosting architecture for the metadata / data portal with distributed data stewards for data updates and maintenance.
- Most (78%) of the SP has some sort of MOUs or SLAs between agencies.
- All states work with some federal agencies, the primary ones being United States Geologic Survey, Department of Homeland Security, and Bureau of Land Management.

4.5 Promoting GIS to Legislature and Higher Management

- Develop relationships through presentations and GIS 101 workshops.
- Find out who sits on what committees in the legislature.
- Find out what bills the legislative members are working on, and then identify how GIS can be connected to them. Then work with the members to make the bill successful.
- Help with high profile projects like elections, where legislature and government officials recognize GIS capabilities from a business needs point of view rather than technology.
- Respond to critical needs within the state like floods, water rights, water supply, E911, homeland security – issues that are vitally important to the government.

4.6 Ways to Justify Need for GIO

- Spend a lot of upfront time planning for the GIO or statewide GIS Coordination position justification.
- Work closely with local government and other state agencies to build advocacy and partnerships.
- Work with land surveyors to achieve buy-in regarding the various GIS datasets and layers.
- Get highly involved with organizations like NSGIC, FGDC, and Western Governor's GIC.
- Team with legislative members and CIO's office to ensure success of their projects and draw GIS connections along the way – achieve visibility.

The actual responses are provided in Tables 1 through 5. Note that the responses presented in the tables are as understood by WESTON during the telephone interviews.

Attachment 1 – 2005 NSGIC State Summaries

Note that the following summary, along with additional pertinent information, is available from the NSGIC (http://www.nsgic.org). This attachment will be updated with the latest information for the final version of the New Mexico Geospatial Strategic Plan.

Table 1a - State Benchmarking Responses - Statewide Standards (Software and Hardware)

STATES	What kind of application development platforms do you use ? e.g. .NET, Java	What software do you use for GIS?	What hardware do you use for GIS?	What Operating Systems do you work with?
California	Various platforms, no standards; mostly Microsoft products	Mostly ESRI	Multi-year, multi vendor contracts; HP for GIS workstations, PCs from Compaq and Gateway	Mostly Windows, some Unix/ Linux
Montana	Various platforms, no standards; mostly Microsoft products	Mostly ESRI	Multi-year, multi-vendor contracts; 90% DELL, some IBM	Mostly Windows, some Unix/ Linux
Idaho	Standardized mostly on Microsoft products, some Unix, hardware/ software standards not really defined	ESRI, MapInfo; DOT uses Intergraph and AutoCAD	Not defined	Mostly Windows, some Unix/ Linux
Oregon	Various platforms	Mostly ESRI	Mostly IBM and DELL	Windows and Linux, but mostly Windows
Arkansas	Various platforms	Various − data is important, how created is not	Various − generic note: standard independent for software, hardware. Data is important, how created is not	Various
Rhode Island	Mostly .NET	Mostly ESRI	Various − no State IT standards	Mostly Windows
Virginia	Mostly .NET, some Java	95-99% ESRI	Storage Area Network (SAN), IBM Blades, Service-Oriented Architecture (SOA)	Mostly Windows-based

Table 1a - State Benchmarking Responses - Statewide Standards (Software and Hardware)

STATES	What kind of application development platforms do you use ? e.g. .NET, Java	What software do you use for GIS?	What hardware do you use for GIS?	What Operating Systems do you work with?
Delaware	Various standards	Mostly ESRI; some AutoCAD	Various − no standards	Various
Utah	.NET and Java	100% ESRI	HP servers, DELL laptops and desktops	Various
Wisconsin	Various platforms	100% ESRI; DOT AutoCAD	IBM blade, HP Servers, SOA	Mostly Windows
Washington	Guidelines stated in GIT conceptual architecture, not standards	91% ESRI	HP, DELL, IBM	Mostly Windows
Colorado	No official standards	Mostly ESRI; some MapInfo in Department of Corrections	No official standards	No official standards
Maryland	Open standards	90% ESRI, some AutoCAD, MapInfo, TNTmips	DELL Servers, Gateway PCs	Mostly Windows
Iowa	No official standards	No official standards	No official standards	No official standards
Arizona	No official standards, fairly decentralized approach	100% ESRI for GIS, some AutoCAD, some ERDAS	No official standards	No official standards

Table 1a - State Benchmarking Responses - Statewide Standards (Software and Hardware)

STATES	What kind of application development platforms do you use ? e.g. .NET, Java	What software do you use for GIS?	What hardware do you use for GIS?	What Operating Systems do you work with?
Pennsylvania	.NET	Predominantly ESRI - 95% in the state, 100% for the enterprise office, although we are starting to look at Google Earth/Maps, Microsoft Virtual Earth for an enterprise strategy, and reviewing other OGC compliant tools	Desktops/laptops-DELL; IBM servers; IBM SAN/NAS systems	Windows XP for laptops and desktops, Windows 2003 for Servers
W. Virginia	No standards, but a lot more Web-based	Mostly ESRI, some Intergraph, AutoCAD	No official standards	Windows; moving from Linux to Windows
Wyoming	Predominantly .NET	Mostly (85%) ESRI, some MapInfo	Mostly DELL, HP (10-12%), Gateway (5-8%)	Predominantly Microsoft products, so Windows

Table 1b - State Benchmarking Responses - Statewide Standards / Data

STATES	What metadata standards do you follow?	Does your data follow any standards? e.g. NSDI, ISO, etc.	What RDBMS do you work with?	Do you have statewide aerial data? Can you provide some specifications?
California	FGDC	NSDI	Mostly SQL Server; some Oracle	Statewide 1m natural color orthophoto quad National Agriculture Imagery Program (NAIP)
Montana	FGDC	NSDI	Mostly SQL Server; some Oracle	Statewide orthophotos
Idaho	FGDC	NSDI	Mostly SQL Server; some Oracle	Statewide NAIP
Oregon	FGDC	NSDI	Standardizing on SQL Server; moved the SDC out of Oracle	Statewide 0.5m true-color orthophotos in 2005
Arkansas	FGDC	NSDI	Various	Available statewide - 1m resolution; maintained every 3-4 years
Rhode Island	FGDC	NSDI	SDE/SQL Server	Yes
Virginia	FGDC	NSDI, Open Geospatial Consortium (OGC), Web Map Service (WMS), Web Feature Service (WFS)	Mostly SQL Server	Statewide NAIP; also statewide 2002 2ft pixel and 2007 1ft pixel. 2007 is due with 6 inch pixel upgrade

Table 1b - State Benchmarking Responses - Statewide Standards / Data

STATES	What metadata standards do you follow?	Does your data follow any standards? e.g. NSDI, ISO, etc.	What RDBMS do you work with?	Do you have statewide aerial data? Can you provide some specifications?
Delaware	FGDC	NSDI	Various	2002 false color infrared (CIR) ortho statewide
Utah	FGDC	NSDI	Mostly SQL Server; State database in it	2006 statewide NAIP 1m; 1m CIR statewide; 15k sq mi of high resolution (1ft-6in combination)
Wisconsin	FGDC	NSDI	SQL Server/ Oracle	2005 1m ortho NAIP statewide
Washington	FGDC	NSDI	SQL Server/ Oracle	NAIP ortho statewide 1m, resampled at 18in
Colorado	FGDC	NSDI	No official standards	Regional aerial photos provided by Counties
Maryland	FGDC	NSDI	Mostly SQL Server (IT standard for DNR who is the major player)	2005 NAIP 1:12K; some Counties have their own orthophotos − 10in/12in resolution
Iowa	FGDC	NSDI	No official standards; DOT uses Oracle Spatial	2002 1m color infrared; 2006 NAIP 1m also available; some LIDAR available

Table 1b - State Benchmarking Responses - Statewide Standards / Data

STATES	What metadata standards do you follow?	Does your data follow any standards? e.g. NSDI, ISO, etc.	What RDBMS do you work with?	Do you have statewide aerial data? Can you provide some specifications?
Arizona	FGDC recommended; not followed by all	NSDI; but not much	No official standards	Statewide 1m DOQQ from Summer 06; plan to acquire 1m NAIP this year
Pennsylvania	FGDC; follow ISO for the data categories	We are working on data standards for PAMAP framework data. We have PA Geospatial Data Sharing Standards (PGDSS, Version 3) and PAMAP Vector Data Standards	Oracle and SQL Server for GTO, DB2 for PASDA (State GIS Clearinghouse)	Pre-2004: 1:12K, 1m pixel DOQQs from USGS; Post-2004: 1:12K, 1m pixel NAIP color infrared statewide in 2004; PAMAP data at 1:2400, 1' pixels (true color, completed first statewide project cycle in Spring 2006, starting maintenance in Spring 2007); Started statewide Lidar data project in Spring 2006, completing 2nd 1/3 of state in Spring 2007, hope to finish in Spring 2008. 1.4m postings, FEMA specs, statewide 2' contours plus DEMs
W. Virginia	FGDC	NSDI	Oracle and SQL Server	2003 2ft natural color 1:48K; no NAIP now
Wyoming	FGDC	Mostly NSDI	Mostly SQL Server, some Oracle	National Orthophoto projects provide statewide aerial

Table 2 - State Benchmarking Responses - General Statistics

STATES	Population (million [M])	Area (sq. miles)	Density (population per square mile)	Total number of parcels statewide? (million [M])	Approximate number of Statewide GIS software licenses
California	37	158,302	234	12M	300 ESRI
Montana	0.9	147,165	6	1M	unknown inventory
Idaho	1.6	83,642	19	1M	50 ESRI; 2 MapInfo
Oregon	3.5	98,466	36	1.7M	Hundreds of ESRI licenses
Arkansas	2.7	53,179	51	1M	200 ESRI
Rhode Island	1	1,214	824	400K	24 ESRI
Virginia	7.5	42,793	175	3.6M	Unknown inventory − ESRI, Intergraph, CAD; university has enterprise license

Table 2 - State Benchmarking Responses - General Statistics

STATES	Population (million [M])	Area (sq. miles)	Density (population per square mile)	Total number of parcels statewide? (million [M])	Approximate number of Statewide GIS software licenses
Delaware	0.85	2,491	341	450K	300-500 ESRI
Utah	2.5	84,876	29	1M	No inventory
Wisconsin	6	65,498	92	3M	Approximately 2,000 ESRI
Washington	5.9	71,342	83	3M	unknown inventory
Colorado	4.7	104,185	45	2.2M	Several hundred ESRI
Maryland	5.3	12,407	427	2M	100-1000 ESRI
Iowa	3	56,272	53	1.5-2M	300 ESRI; DOT uses Geomedia and AutoCAD

Table 2 - State Benchmarking Responses - General Statistics

STATES	Population (million [M])	Area (sq. miles)	Density (population per square mile)	Total number of parcels statewide? (million [M])	Approximate number of Statewide GIS software licenses
Arizona	5.5	113,998	48	2M	100-200, mostly ESRI
Pennsylvania	12	46,000	261	4M	Approximately 600 ESRI desktop licenses, 100 Intergraph GeoMedia licenses
W. Virginia	1.8	24,244	74	1.4	100-200 ESRI
Wyoming	0.5	97,818	5	1.6M	<500 ESRI

Table 3a - State Benchmarking Responses CIO / GIO Office (Part 1 of 3)

STATES	Does CIO Office exist?	Does GIO Office exist?	If GIO Office is not there, do you plan for GIO?	If GIO Office exists, what are the successes due to creation of this position?	Total number of employees in GIO/ State GIS Coordinator's Office?
California	Yes - 46 people	No	Yes; its not control function but coordination - we plan to spread this message;	N/A	State coordinator's Office has 11 people
Montana	Yes	Yes	Done	Budgeting, centralized control and coordination of GIS efforts statewide	State coordinator's Office has 7 people
Idaho	No	No	Yes; first CIO office needs to be filled up	Information Technology Resource Management Council (ITRMS) tries to do GIO role now	6 including State GIS Coordinator
Oregon	Yes	No	Yes, but hard to move up the ladder for the candidate; he is functionally the GIO but officially he is multiple levels below; politically hard to get multiple promotions at one go; but that doesn't hinder him to do what he wants to do regarding GIS	N/A	5
Arkansas	Yes, but will be replaced shortly by CTO - 200 people	No	No. It is being done unofficially, because that will open up legislation for amendment, thus rendering other things vulnerable; title not needed to get work done	N/A	8
Rhode Island	Yes; 110k CIO salary	No	Nothing yet	N/A	4

Table 3a - State Benchmarking Responses CIO / GIO Office (Part 1 of 3)

STATES	Does CIO Office exist?	Does GIO Office exist?	If GIO Office is not there, do you plan for GIO?	If GIO Office exists, what are the successes due to creation of this position?	Total number of employees in GIO/ State GIS Coordinator's Office?
Virginia	Yes	Yes; GIO need is mandated thru legislature	N/A	Public safety; E911 data; road centerline and state orthophoto efforts; distribute funding correctly by coordinated efforts; chase funding	8
Delaware	Yes	No	Yes	N/A	1 man team
Utah	Yes	Yes	N/A	GIS services, service center concept, clearinghouse - all centralized.	20
Wisconsin	Yes	No	Developing, not actively planning	N/A	3
Washington	Yes	No	Developing	N/A	1 person team
Colorado	Yes	No	Developing	N/A	1 person team
Maryland	Yes	No	Developing	N/A	1 person team
Iowa	Yes	No	Nothing much	N/A	1 person volunteer for state GIS coordination

Table 3a - State Benchmarking Responses CIO / GIO Office (Part 1 of 3)

STATES	Does CIO Office exist?	Does GIO Office exist?	If GIO Office is not there, do you plan for GIO?	If GIO Office exists, what are the successes due to creation of this position?	Total number of employees in GIO/ State GIS Coordinator's Office?
Arizona	Yes, but not at all related to GIS; he is not pro GIS	No	Yes, but no formal planning is done; people are just talking about it without much coordinated efforts to plan and promote the GIO position	N/A	6 persons in the State GIS Coordinator's office - actually the State Cartographer's Office

Table 3a - State Benchmarking Responses CIO / GIO Office (Part 1 of 3)

STATES	Does CIO Office exist?	Does GIO Office exist?	If GIO Office is not there, do you plan for GIO?	If GIO Office exists, what are the successes due to creation of this position?	Total number of employees in GIO/ State GIS Coordinator's Office?
Pennsylvania	Yes	Yes - Geospatial Technology Office	N/A	Governance organization for state agencies. Capitalized on agency data investments by building an enterprise geospatial database so that data can be published into a single repository and brought out of agency data silos. Shared geospatial application hosting environment. Created mapping services and enterprise geospatial application web services for address verification, address geocoding, boundary geocoding, etc. that are shared with numerous agencies and external government entities. Educated administration and agencies on the benefits of PAMAP imagery and elevation project and found funding for the same. Set Commonwealth geospatial priorities, established geospatial policies and standards to align agency projects with the enterprise mission. Won $4M in federal grants for geospatial projects. Built an IRRIS geospatial portal for Commonwealth public safety and homeland security.	Currently, 3.5. Will be hiring an additional 5 persons this year which will bring us to 8.25 (.25 of Deputy CIO's/GIO's time)

Table 3a - State Benchmarking Responses CIO / GIO Office (Part 1 of 3)

STATES	Does CIO Office exist?	Does GIO Office exist?	If GIO Office is not there, do you plan for GIO?	If GIO Office exists, what are the successes due to creation of this position?	Total number of employees in GIO/ State GIS Coordinator's Office?
W. Virginia	Yes, but not directly related	No	Yes, planning process is going on	N/A	2
Wyoming	Yes	No	Yes, proposed this budget cycle	N/A	Proposed 1, in addition, there is a proposed Project Management Office with 2 people

Table 3b - State Benchmarking Responses - CIO / GIO Office (Part 2 of 3)

STATES	Budget for CIO Office? (million [M])	Budget for GIO/GIS Coordinator Office? (thousand [K])	Is GIO/GIS Coordinator budget base funding? (thousand [K])	How GIO/GIS Coordinator's budget is decided?
California	8M	Being developed; no dedicated IT/GIS budget; each agency pursue budget for own GIS activities	Yes	No dedicated budget other than base funding; agencies pursue their budget with particular business goal; well-enforced budget proposal process
Montana	1M	500K	Yes (250K)	Always look for funds for all projects; also State land information act supports the State GIS coordination base funding
Idaho	Developing	Developing	No	No budget; no specific process; be the cheerleader and try to find concensus and money
Oregon	51M / 2 yr	2M/ 2yr (.5M for only GIS service/sw per yr) - base	Yes − comes from Governor/CIO	Base always comes; Governor and CIO are pro-GIS. Governor has 5M budget for NavigatOR − the data clearinghouse
Arkansas	77M / 2 yr	700K/ 2 yr - base	Yes	Base funding always comes
Rhode Island	No idea	No idea	No	Capitol grants, Federal funding
Virginia	No idea	2.7M/yr	Approximately 1M base funding for salary and overhead expenses	Mostly E911 efforts, grants, DHS, U.S. Geological Survey (USGS), general funds

Table 3b - State Benchmarking Responses - CIO / GIO Office (Part 2 of 3)

STATES	Budget for CIO Office? (million [M])	Budget for GIO/GIS Coordinator Office? (thousand [K])	Is GIO/GIS Coordinator budget base funding? (thousand [K])	How GIO/GIS Coordinator's budget is decided?
Delaware	No idea	not very clear	Nothing fixed as base	Unknown
Utah	No idea	3M	800K base funding	CIO budget, data acquisition projects, other projects and grants
Wisconsin	No idea	280K	Volatile base	CIO and grants/ projects
Washington	No idea	250K	Only salary is covered through base funding	CIO Office, projects
Colorado	No idea	125-150K	Volatile base	E911, grants, Federal, USGS, divisions of Local Government, and Department of Local Affairs
Maryland	No idea	No idea	Unknown	Sell data, fund through other overheads, contracts/ grants
Iowa	No idea	No idea	Unknown	Unknown

Table 3b - State Benchmarking Responses - CIO / GIO Office (Part 2 of 3)

STATES	Budget for CIO Office? (million [M])	Budget for GIO/GIS Coordinator Office? (thousand [K])	Is GIO/GIS Coordinator budget base funding? (thousand [K])	How GIO/GIS Coordinator's budget is decided?
Arizona	No idea	600K	Almost all of 600K is base; it covers salary (around 250K), hardware, software, and networking	Budget comes from Director of Administration
Pennsylvania	Not for publication	Not for publication	We receive general funds from OIT/Office of Administration. Funding has been stable for 3 years. We have been able to win DHS SHSP grant funding, some federal earmarks from FHWA, etc.	Budget comes from CIO office, general funds
W. Virginia	No idea	200K in 2007	Part of it only is base funding	Budget comes from Director of State Geological Survey and Department of Commerce
Wyoming	$52M for 2 years	$1.9M for 2 years	Mostly	CIO, through general funds

Table 3c - State Benchmarking Responses - CIO/GIO Office (Part 3 of 3)

STATES	Are there any multi-agency collaborations for GIS work?	What is the GIO/ GIS Coordinator's total compensation? (thousand [K])	What are the GIO/GIS Coordinator duties?	Does any GIS advisory committee exist?	Upcoming initiatives at the GIO/GIS Coordinator?
California	Yes - data acquisition	Being developed	Reference website	California GIS Council (CGC); California Geographic Information Association (CGIA)-association of GIS professionals; 18 collaborative bodies across CA	Moving towards more statewide collaboration, service oriented architecture (SOA), web base technology
Montana	Yes-data acquisition	Approximately 100K	Reference website	CIO, 2 deputy CIOs, MT land info advisory council - applies for grants and perform advisory role	Structured GIS collaboration, get federal grants
Idaho	Yes; for funds	None	Not available	Information Technology Resource Management Council (ITRMC), Idaho GIS Council (IGC)	CIO, GIO needed. But getting shot down due to absence of proper plans
Oregon	Yes, for funds, infrastructure, data	Approximately 110K	Reference website	OGIC; structured legislative workgroups also exist	Collaboration for 14 themes
Arkansas	Yes, mostly for data development	90K	Reference website	Arkansas State Land Information Board (ASLIB), Arkansas Geographic Information Office (AGIO), ad hoc advisory councils- "User Forums"	Update the governor about GIS; sell GIS to the legislature
Rhode Island	To some degree	75K		Rhode Island Transportation Information System (RITIS), ad hoc committees	

Table 3c - State Benchmarking Responses - CIO/GIO Office (Part 3 of 3)

STATES	Are there any multi-agency collaborations for GIS work?	What is the GIO/ GIS Coordinator's total compensation? (thousand [K])	What are the GIO/GIS Coordinator duties?	Does any GIS advisory committee exist?	Upcoming initiatives at the GIO/GIS Coordinator?
Virginia	Yes, legislative mandate to create rate structure for services	125K including benefits; other staff 150K	Enterprise data development; oversee metadata; negotiate with federal agencies for grants/ contracts; channelize E911 funding and projects; provide GIS services	Virginia IT Agency; Wireless Services Board (mainly for E911) - advisory committee; Virginia Geographic Information Network (VGIN)- Advisory Board	portal on PTK by May-June 2007; E911 efforts always there
Delaware	Sometimes for data acquisition	60K	Mainly coordination of statewide efforts, elevation and aerial data, grants	Delaware Geographic Data Committee; Delaware SDI Framework Implementation Team (ITEAM)	Statewide GIS coordination push; statewide elevation data and aerial photography;
Utah	Yes, data	80K	Centralized service centre; build central database statewide; house and maintain all data; get grants for projects	GIS Advisory Committee (GISAC)- advisory; Utah Geographic Information Council (UGIC) - council for annual conference; Tech interchange group - user group; GPS advisory committee, other regional councils	ArcGIS Server and Image Server implementation; SOA and web services; Data acquisition
Wisconsin	Yes, data	80K	Coordination of data acquisition efforts; need for a "go to" person.	Wisconsin Enterprise GIS Team; Wisconsin land information association	Central GIS data repository; Enterprise License Agreement with ESRI; geocoding web service development
Washington	Yes, imagery and data	70-115K		WAGIC - advisory committee; Information Services Board - decisions	Ortho data acquisition and portal development

Table 3c - State Benchmarking Responses - CIO/GIO Office (Part 3 of 3)

STATES	Are there any multi-agency collaborations for GIS work?	What is the GIO/ GIS Coordinator's total compensation? (thousand [K])	What are the GIO/GIS Coordinator duties?	Does any GIS advisory committee exist?	Upcoming initiatives at the GIO/GIS Coordinator?
Colorado	Yes, aerial data through DHS funds	80K	Work with local govt; E911 and DHS projects; chase funds and grants; assist local government technically; develop GIS capabilities for DHS; centralize coordination	State Agency GIS Group; Ad hoc Councils - state, local, federal, private sectors	Effort mostly depend on general fund availability and Director 's (Division of local government) leadership
Maryland	Yes, some for data acquisition	90-100K		MSGIC -Advisory body; 3 ArcView User Groups-Technical	Push for GIO; Statewide orthophoto 6inch / 3inch acquisition; federal grants and projects; address range attachments to key datasets
Iowa	Yes, for aerial orthophotos	Now voluntary − coordinator is part of the regional council of government		IGIC - represented by state, city, county, education, private sectors	Trying to promote GIS to the top executive level
Arizona	Some aerial data acquisition and framework data creation efforts are occurring	60-70K		Arizona Geographic Information Council - acts as executive advisory board appointed by governor represented by state, federal, local, education and private sectors	DOT - transportation framework data; Bureau of land management - considering migration to GCDB and PLSS datasets; Create Statewide datasets for general plans

Table 3c - State Benchmarking Responses - CIO/GIO Office (Part 3 of 3)

STATES	Are there any multi-agency collaborations for GIS work?	What is the GIO/ GIS Coordinator's total compensation? (thousand [K])	What are the GIO/GIS Coordinator duties?	Does any GIS advisory committee exist?	Upcoming initiatives at the GIO/GIS Coordinator?
Pennsylvania	More data acquisition statewide. Data stewardship project will commence in next 12 months. Planning for statewide GIS Advisory Council formation	Not for publication	Executive Order 2004-8 indicated responsibility for geospatial investment strategy, Geospatial Enterprise Architecture, data sharing, extended enterprise partnerships	Geospatial Technology Advisory Committee (GTAC) - policy. Geospatial Technology Steering Committee (GTSC) - technology. Geospatial Communities of Practice (GeoCoPa) - will bring geospatial agencies with similar lines of business together to work on projects, standards, best practices	Reorganization in the GTO office. Effort to formalize the statewide advisory council. PAMap to get new imagery and start aggregating county level data into statewide data layers. Enterprise licensing and enterprise database creations
W. Virginia	NAIP imagery acquisition	60K		West Virginia Association of GIS Professionals - advisory council and committee	NAIP imagery acquisition; GIS Coordinator for State
Wyoming	Data acquisition and Portal	75K	Reference document	Oversight Advisory Committee-Policy and Advise, and DAG Advisory Group-Technical	Clearinghouse/Portal, inventory of statewide data, and coal bed methane E-permit system

Table 4 - State Benchmarking Responses - GIO Justification

STATES	How did / would you justify GIO position?	What major obstacles did you face for creating GIO position?	Who was internal champion for GIO position?	Any Cost-Benefit Analysis done? Any documentation?
California	CIO understands; awareness for homeland security needed - this is the crisis; lack of statewide consistent data; duplication of effort with no consistency - this will promote the need for GIO	People with authority and decision making power disagree with each other and stall the process; funding is a constraint; some people incorrectly think that GIO will be another level of supervision	CIO and councils	Business case will not be to save money, but to do expenditure more intelligently and in a coordinated way
Montana	Common operating picture is needed; we always tend to disagree in MT on various issues; so need GIO to coordinate and oversee GIS efforts	People with authority and decision making power disagree with each other and stall the process; failure to understand that GIS supervision is important for decentralized operations and IT; state library caused problem because they hosted the data and portal for long time but became archaic - don't want to give up and lobby against advancements	CIO and members of various state agencies	Nothing
Idaho	We didn't, no plan/ methodology/ budget/ recommendation; just submitted to legislation without proper planning and backup justification to support the proposition and surprised them	Couldn't justify, we were not prepared and legislation said 'no' to GIO; the plan was presented as surprise to the legislation with no strategy, objectives, benefits, planning, Cost-benefit analysis etc.	Information Technology Resource Management Council (ITRMC) tries to push	Nothing
Oregon	CIO and Governor understands; corporate sponsorship is there; need a forum to discuss and resolve issues for data, funding, liabilities and GIS efforts. We are pushing to form that forum.	Preferred candidate has to be promoted by three levels to become GIO, its not easy, so it is not happening; no other contender but internal politics is stalling the effort	CIO, Legislation, Governor led next step by forming legislative workgroup to recommend organization structure, resolve issues, look for funding	Developing

Table 4 - State Benchmarking Responses - GIO Justification

STATES	How did / would you justify GIO position?	What major obstacles did you face for creating GIO position?	Who was internal champion for GIO position?	Any Cost-Benefit Analysis done? Any documentation?
Arkansas	Not needed	N/A	Provide data at no cost, don't say no to anybody wanting data, wide use of data and technology - made Governor and CIO champions	Nothing
Rhode Island	Nothing planned	Nothing planned	One member in state legislation was really pushing for GIO, but he left	Nothing
Virginia	Promote the position in legislature and CIO office; also E911 needs; save money by centralized coordination and need structure to support coordination	Nothing major	CIO, Legislative member	Cell phone tax revenue go to E911 and comes to GIS as funding - this is huge; there is no documentation.
Delaware	Disconnect of data at state and local levels; maintain data for land use planning; get statewide elevation data (5-10M) for flood control coz it's a flat state; DHS and E911 projects need dedicated coordination	We didn't get executive buy-in yet; no budget yet; no funding structure	Governor and CIO	Nothing
Utah	Promote to satisfy bigger needs; help elections; 101 workshops with high profile people in legislation and management; partner closely with local government; build relation with legislative staff; work with NSGIC and FGDC	No major obstacles yet	CIO, local government, county commissioners	Nothing

Table 4 - State Benchmarking Responses - GIO Justification

STATES	How did / would you justify GIO position?	What major obstacles did you face for creating GIO position?	Who was internal champion for GIO position?	Any Cost-Benefit Analysis done? Any documentation?
Wisconsin	Create central clearinghouse / portal; establish single point of contact for GIS coordination; emergency response projects coordination	No major obstacles yet; haven't really promoted the plan to that level to confront obstacles; DOT and DNR keep fighting to hold the GIS coordination position; so this position is moved to CIO office	Previous CIO; we do not have a identified champion now	Nothing
Washington	Developing	No major obstacles yet	CIO is champion; Governor understands	Nothing
Colorado	No urge to justify; no initiative to promote GIS coordination	No obstacles as no efforts for GIO has been initiated	Director - division of local government; E911 Officials	Nothing
Maryland	Developing strategic plan for GIO; show success in the statewide orthophoto acquisition project, sharing GIS needs; achieve NSGIC goals / success through GIO	Not yet	Governor, CIO and some agency officials	Not yet
Iowa	Developing	CIO - needs GIS education; some GIS community - needs to understand the importance of GIS coordination	One in the legislature	Nothing
Arizona	No real plans to promote that position	We largely work within statutes, and GIO is not within statutes; there is no real proposal for GIO so no real obstacles	Nobody; there is no identified champion; mostly some mid level managers who are state employees	Nothing

Table 4 - State Benchmarking Responses - GIO Justification

STATES	How did / would you justify GIO position?	What major obstacles did you face for creating GIO position?	Who was internal champion for GIO position?	Any Cost-Benefit Analysis done? Any documentation?
Pennsylvania	Uncoordinated efforts of state agencies and local/federal governments in Pennsylvania cost more than coordinated efforts; Reduce overlap and duplication of efforts to save taxpayer dollars; Capitalize on the largest cost of Geospatial operations - data; Maintain a strategic plan that highlights priorities and needs, vision/roadmap for achieving goals, identification of return on investment and benefits for coordination, evangelize and shed light on the key benefits of Geospatial Technologies/GIS for executive decision making, improving efficiencies in government services to citizens, geospatial preparedness to make state safer, and use as an integration tool.	Concern about changing the agency business processes and impact that an enterprise office would have on them; concern about having too much power;	CIO, Governor's Office, Office of Administration	For individual projects- yes. Overall strategy and business plan- no.
W. Virginia	Major justification came from the lawsuit that tax revenue from coal properties are not effectively tracked - this may lead to diminished revenue and energy crisis; also, its being pushed through Executive Orders and funding	People with authority and decision making power disagree with each other and stall the process; funding is a constraint.	Not really any champion, but governor understands DHS and public safety issues	Nothing
Wyoming	Reference document	Reference document	Governor, CIO, and Representatives from various agencies	Reference document

Table 5a - State Benchmarking Responses - Portal Clearinghouse / Structure (Part 1 of 2)

STATES	Any centralized clearinghouse/ portals exist?	How are GIS service centers structured? Centralized or distributed?	Any MOU, SLA, or security agreements?	Do you work with federal agencies?
California	IT prefers centralized portal for management/ maintenance purpose as it delivers the economy of scale; Framework data will be hosted in this portal	Distributed model for data maintenance through data stewards	Nothing yet due to cultural/ organizational barrier	Yes - a lot of them including USGS and BLM.
Montana	We are working towards it; Someone need to be identified to be the integrator for the portal; we prefer a hybrid model	Several agencies exist that do their own GIS in a distributed way.	Nothing; Our state is very open regarding data access, availability and sharing; only library causes some problems intermittently including charging for data	Yes, very much.
Idaho	Very much centralized through University of Idaho. We provide access to most of the data through the portal.	Each agency maintains own GIS shop for data stewardship	Many MOUs to share data and data-security, Also disclaimers exist	Yes, USGS, BLM, Bureau of Information, and NRCS
Oregon	Imagery portal on ER Mapper is hosted as a component of NavigatOR; GIS clearinghouse is the "NavigatOR" that is based on ESRI Portal Toolkit	Distributed service centers, data stewards; Centralized service center concept failed; thus the initiative was taken to create State GIS Coordinator	Yes. MOUs are need to solve three issues for central data sharing partnership - privacy, funding, and liability	Yes, very much.
Arkansas	Yes; pay $64k/yr to Department of Information Services (DIS) to host the portal	Distributed stewards maintain data, we maintain mechanism and frequency of updates and DIS just hosts the portal	Some exist; data exchange happens between our portal and GNIS (USGS Geographic Name Information System)	Yes, very much
Rhode Island	University owns and hosts a public site similar to a portal	Distributed data stewards, hybrid model	Some exist	Yes, to some extent

Table 5a - State Benchmarking Responses - Portal Clearinghouse / Structure (Part 1 of 2)

STATES	Any centralized clearinghouse/ portals exist?	How are GIS service centers structured? Centralized or distributed?	Any MOU, SLA, or security agreements?	Do you work with federal agencies?
Virginia	Real clearing house does not exist now, but the portal is coming up in May 2007	We provide support for portal; agencies pay for their support; most support operations at Virginia IT Agency is outsourced to Northrop Grumman	Some - DOT, some state agencies and IT	Yes
Delaware	Delaware DataMill - IMS site; sort of portal; university operates metadata portal	Some uncoordinated efforts; hybrid model	None	Yes
Utah	Very centralized - house all data and services;	All GIS Services are centralized	Many; most of the data are in the centralized infrastructure has data sharing MOUs	Yes, a lot
Wisconsin	Do not have a good clearinghouse- some voluntary management at the university; Wisconsin Integrated Legislative Information Systems (WILIS) - didn't pan out well	N/A	Few, if any at all	Yes, trying to work with more federal agencies
Washington	Portal hosted by University of Washington at the library; it is the state clearinghouse	Hybrid - data stewards maintain their data	Some	Yes
Colorado	Totally decentralized, no central management; now working on portal development with ESRI Denver using Portal Toolkit	Nothing structured yet	Nothing worth mentioning	Yes
Maryland	University will house at least the framework layers in future	Decentralized; data stewards will maintain their own datasets	Some MOUs and SLAs	Yes

Table 5a - State Benchmarking Responses - Portal Clearinghouse / Structure (Part 1 of 2)

STATES	Any centralized clearinghouse/ portals exist?	How are GIS service centers structured? Centralized or distributed?	Any MOU, SLA, or security agreements?	Do you work with federal agencies?
Iowa	Metadata portal at the university	Totally decentralized; data stewards (mainly DNR, local government) maintain their data	Not many exist	Yes; some
Arizona	The land information office hosts the portal now - Arizona Map; its not complete, have some metadata links and some downloads; as of now others send data to us, but hybrid model is preferred	Very much decentralized, and no effective coordination	Not much	Sometimes
Pennsylvania	Penn State University hosts our portal/clearinghouse. DEP paid $560K when they started to host; now we pay $350K. PASDA (www.pasda.psu.edu) is our clearinghouse. Full time staff of 4. GTO provides mapping services for government partners and first responders. PASDA provides data access, downloads, some applications, and data/metadata consulting to everyone, including the general public.	GTO has a centralized enterprise geospatial database. Physical design allows each agency to access and maintain their own data. We provide a conceptual model that shares nonsensitive data using mapping services that are thematic (boundaries, transportation, hydro, etc.). Agencies still maintain their own individual data silos. Trying to get agencies to host their applications and data in the Geospatial Enterprise Server Architecture (GESA), which contains the enterprise database and shared application hosting environment.	Data stewardship agreements being looked at overall by OIT, but just getting started. Geospatial data sharing will be accommodated under that enterprise model for data sharing and data stewardship. Security is also being reviewed at the enterprise level.	Yes, but limited due to limited staff resources.
W. Virginia	Clearinghouse hosted by department of geology and geography at West Virginia University	It's a hybrid model and hosts the 7 framework data layers (NSDI)	Some	Yes

Table 5a - State Benchmarking Responses - Portal Clearinghouse / Structure (Part 1 of 2)

STATES	Any centralized clearinghouse/ portals exist?	How are GIS service centers structured? Centralized or distributed?	Any MOU, SLA, or security agreements?	Do you work with federal agencies?
Wyoming	University of Wyoming (WYGISC) hosts the clearinghouse	Hybrid model, data stewards maintain their own data and publish links	Some	Yes, a lot

Table 5b State Benchmarking Responses - Clearinghouse / Data (Part 2 of 2)

STATES	Do you have stewardship towards national map?	Statewide GIS data availability? If yes, how openly and easily available?	Important Links
California	Yes. Geospatial One Stop Portal (GOS) harvests weekly; online GIS data library; hosts framework data and raster data	Consolidated State Data Center; some data are free, some are chargeable	www.ceres.ca.gov; www.cgia.gov
Montana	Yes. GOS harvests weekly; 7 framework, 6 State spatial data infrastructure (SDI) layers towards national map	7 framework, 6 (MSDI) layers exist; all data free in Montana	
Idaho	Yes. 6 framework layers are available for weekly GOS harvests	6 framework data; some free some chargeable	www.insideidaho.org
Oregon	Yes. 14 themes - 7 framework and 7 State SDI layers; GOS harvests regularly	14 theme layers − 7 (NSDI), 7 MSDI	http://www.oregon.gov/DAS/EISPD/GEO/gisutility.shtml
Arkansas	Yes. GOS harvests regularly	Agencies publish through central clearinghouse	www.geostore.ak.gov
Rhode Island	Yes. GOS harvests regularly; 5 framework layers and 3 State SDI	Yes	
Virginia	Yes. GOS harvests once a week; only 3 framework layers are ready. By May-June 2007, portal on Portal Toolkit (PTK) will be done.	Available through Counties and State clearinghouse	www.vgin.virginia.gov; www.gisdata.virginia.gov

Table 5b State Benchmarking Responses - Clearinghouse / Data (Part 2 of 2)

STATES	Do you have stewardship towards national map?	Statewide GIS data availability? If yes, how openly and easily available?	Important Links
Delaware	Yes. First State to boast 9 framework layers statewide; GOS harvests weekly	Delaware Data Mill - on-line framework data layers available	
Utah	Yes. 18 critical themes (7 framework, plus 11 State SDI), 300 geodatabases (GDB)	Available from central clearinghouse; some assessor's data is chargeable	
Wisconsin	Not really; GOS doesn't harvest as of now; no definitive or complete data layer for framework	Countywide good, statewide not good; some data chargeable	
Washington	Yes. GOS harvests weekly; 7 framework layers	Data available, hosted at university Portal by the library	www.wagic.wa.gov
Colorado	No stewardship. GOS doesn't harvest at this time.	Somewhat available; 3 framework data layers are available; Portal hosted by State Library is essentially defunct	
Maryland	Yes. 6 framework layers exist. GOS harvests weekly	Metadata Portal − only links; university doesn't host data, only links in the Portal	www.marylandgis.net
Iowa	Iowa Department of Natural Resources (DNR) worked towards national map; no real framework layers now; some data is existing. GOS harvests the portal hosted by the university	Data available through the Portal (PTK) hosted by the university. Data is mostly free	

Table 5b State Benchmarking Responses - Clearinghouse / Data (Part 2 of 2)

STATES	Do you have stewardship towards national map?	Statewide GIS data availability? If yes, how openly and easily available?	Important Links
Arizona	Not really; Arizona map is not effectively a part of the national map system	Some framework data available, not in NSDI themes; there is a metadata Portal allowing on-line data download mostly from Arizona land information systems	
Pennsylvania	Yes - We have a full clearinghouse hosted at the Pennsylvania State University with weekly GOS harvests (www.pasda.psu.edu)	Yes, TANA enterprise license (e.g. Dynamap Transportation for roads) being used by many state agencies, regional government organizations, some counties. PAMAP providing statewide imagery and elevation data. Completed statewide NHD 1:24K in 2005. Don't have parcels or buildings. Pretty good geodetic monumentation layer at DOT. Working on utilities statewide - major electrical and petroleum transmission utilities. PAMAP will aggregate county data to create new statewide data layers in the future.	www.gis.state.pa.us; www.oagtdatasvcs.state.pa.us; www.pasda.psu.edu;
W. Virginia	Yes; GOS harvests clearinghouse portal hosted at the university once a week	All 7 layers of framework NSDI is there; one of the first States to do that	www.wvagp.org
Wyoming	Yes, but don't know to what extent.	Yes, through the clearinghouse/Portal hosted at the University of Wyoming	

APPENDIX B

STATE FRAMEWORK DATA INVENTORY

New Mexico Framework Layers
for Weston Survey
(June 2007)

Data Set Classification	Dataset name - Layer Name	Data Currency	Accuracy/Scale	Extent (Completeness)	Ground Sample resolution	Coordinate System	Fee Associated	Metadata (Completeness)	Update Frequency
Statewide									
Orthophotography									
2006 Digital Orthophotography									
	2006 Color (RGB)	2006	The DOQQ's have not been field checked by a third party for objective accuracy against ground features, but over 90% of permanent identifiable locations in the image have been sampled and found to adhere to within 3.0 meters of preexisting line work and imagery.	This dataset is the continuation of the 2005 Color (RGB) dataset. It completes the project, filling in the gaps from the 2005 set, and also has reflight data from shadow areas from 2005. (775 DOQQs)	1 meter	UTM, Zone 13, NAD83, meters	None, unless special order	FGDC Compliant, Individual, Complete	See 2005 comments
	2005-2006 Color Infrared (CIR)	2006	The DOQQ's have not been field checked by a third party for objective accuracy against ground features, but over 90% of permanent identifiable locations in the image have been sampled and found to adhere to within 3.0 meters of preexisting line work and imagery.	Upper Rio Grande Water Operations Model (URGWOM) project - (3264 DOQQs) project completed to cover the Rio Grande Drainage within New Mexico	1 meter	UTM, Zone 13, NAD83, meters	None, unless special order	FGDC Compliant, Individual, Complete	As funding allows
2005 Digital Orthophotography									
	2005 Color (RGB)	2005	The DOQQ's have not been field checked by a third party for objective accuracy against ground features, but over 90% of permanent identifiable locations in the image have been sampled and found to adhere to within 3.0 meters of preexisting line work and imagery. (7,785 DOQQs)	This dataset has both gaps and shadow areas. It was completed using the 2006 reflight DOQQs.	1 meter	UTM, Zone 13, NAD83, meters	None, unless special order	FGDC Compliant, Individual, Complete	As funding allows
Transportation									
	GPS Roads	1995	The root-mean square error is generally .003 map units or less.	Complete for project		Geographic NAD83	None	FGDC Compliant	
	New Mexico Airports	1998	The root-mean square error is generally .003 map units or less.	Complete		Geographic NAD83	None	FGDC Compliant	As needed

New Mexico Framework Layers
for Weston Survey
(June 2007)

Data Set Classification	Dataset name - Layer Name	Data Currency	Accuracy/Scale	Extent (Completeness)	Ground Sample resolution	Coordinate System	Fee Associated	Metadata (Completeness)	Update Frequency
	New Mexico Railroads (TIGER 2000)	2000	The positional accuracy varies with the source materials used, but generally the information is no better than the established national map Accuracy standards for 1:100,000-scale maps from the U.S. Geological Survey (USGS); thus it is NOT suitable for high-precision measurement applications such as engineering problems, property transfers, or other uses that might require highly accurate measurements of the earth's surface.	Complete		Geographic NAD83	None	TIGER Generic metadata, txt format	As needed, 2006 TIGER to be put out to supplement data
	E 911 (NM_RCL)	2007	Road centerline features are considered more than accurate enough for the purposes of 9-1-1 call mapping if they are visually accurate at a scale of 1:5,000 when compared with DOQQs or 1-second interval differential GPS readings	Complete State of NM	N/A	Universal Transverse Mercator Zone 13 (North), North American Datum 1983, units = meters	None	Minimal	Several times per week, as needed
Hydrography									
	New Mexico Surface Water and Surface Drainage	1991	The root-mean square error is generally .003 map units or less. Only surface water and surface drainage boundaries were extracted from the source graphic. The data contains all lines and polygons representing New Mexico surface water and surface drainage and the New Mexico state boundary. These data meets National Accuracy Standards for 1:500,000 scale maps.	Data completeness reflect the content of the source graphic.		Geographic NAD27	None	FGDC Compliant, txt format	As needed
	National Hydrography Dataset	2006	Statements of horizontal positional accuracy are based on accuracy statements made for U.S. Geological Survey topographic quadrangle maps. These maps were compiled to meet National Map Accuracy Standards. For horizontal accuracy, this standard is met if at least 90 percent of points tested are within 0.02 inch (at map scale) of the true position. Additional offsets to positions may have been introduced where feature density is high to improve the legibility of map symbols. In addition, the digitizing of maps is estimated to contain a horizontal positional error of less than or equal to 0.003 inch standard error (at map scale) in the two component directions relative to the source maps. Visual comparison between the map graphic (including digital scans of the graphic) and plots or digital displays of points, lines, and areas, is used as control to assess the positional accuracy of digital data. Digital map elements along the adjoining edges of data sets are aligned if they are within a 0.02 inch tolerance (at map scale). Maps were created at 24,000 scale.	State is complete with 84 Units		Geographic NAD83	None	Generic for country, xml format	As needed
Political Boundaries									

New Mexico Framework Layers
for Weston Survey
(June 2007)

Data Set Classification	Dataset name - Layer Name	Data Currency	Accuracy/Scale	Extent (Completeness)	Ground Sample resolution	Coordinate System	Fee Associated	Metadata (Completeness)	Update Frequency
	State Boundary	1994	TIGER data, 1:100,000 scale. The root-mean square error is generally .003 map units or less.	State, complete		Geographic NAD83	None	FGDC Compliant, txt format	As needed
	County Boundaries	2000	The positional accuracy varies with the source materials used, but generally the information is no better than the established national map Accuracy standards for 1:100,000-scale maps from the U.S. Geological Survey (USGS); thus it is NOT suitable for high-precision measurement applications such as engineering problems, property transfers, or other uses that might require highly accurate measurements of the earth's surface.	State, complete but subject to revision		Geographic NAD83	None	TIGER Generic metadata, txt format	As needed, will be done in 2006 to reflect Bernalillo/Sandoval county boundary change
	BLM Land Grant Boundaries	2003	This data has been collected by the U.S. Bureau of Land Management (BLM) in New Mexico at the New Mexico State Office. The initial data source is the statewide Public Land Survey System (PLSS) coverage for the state of New Mexico, generated at the BLM New Mexico State Office. Additional data was onscreen-digitized from BLM Cadastral Survey Plats and Master Title Plats, or tablet-digitized from 1:24,000 paper maps. This revision reflects boundary adjustments made in the Albuquerque area to more accurately reflect boundaries as depicted on USGS 1:24,000 topographic maps. No warranty is made by the Bureau of Land Management as to the accuracy, reliability or completeness of these data for individual use or aggregate use with other data, or for purposes not intended by BLM. Spatial information may not meet National Map Accuracy Standards. This information may be updated without notification.	Statewide, complete but revised as needed		UTM Zone 13, NAD83, meters	None	Available in xml format	As needed
	Indian and Military Reservation Boundaries	1997	This data set contains boundaries for Indian Reservation and Trust Lands and Military reservations in New Mexico at a scale of 1:100,000. The root-mean square error is generally .003 map units or less.	Data completeness reflects the content of the source file.		Geographic NAD83	None	FGDC compliant, but needs update, txt format	As needed
	Voting Precincts	2006	Unknown	Statewide, complete		Geographic NAD83	None	FGDC compliant, htm format	As needed, or provided by NM Secretary of State

New Mexico Framework Layers
for Weston Survey
(June 2007)

Data Set Classification	Dataset name - Layer Name	Data Currency	Accuracy/Scale	Extent (Completeness)	Ground Sample resolution	Coordinate System	Fee Associated	Metadata (Completeness)	Update Frequency
	State Legislative Boundaries, both Upper and Lower Chambers	2006	The root-mean square error is generally .003 map units or less.	Statewide, complete		Geographic NAD83	None	TIGER 2006SE, will be compliant	As needed
	Incorporates and Designated Places	2000	The positional accuracy varies with the source materials used, but generally the information is no better than the established national map Accuracy standards for 1:100,000-scale maps from the U.S. Geological Survey (USGS); thus it is NOT suitable for high-precision measurement applications such as engineering problems, property transfers, or other uses that might require highly accurate measurements of the earth's surface.	Statewide, complete		Geographic NAD83	None	TIGER Generic metadata, txt format	As needed
	Metro Boundary of Towns > 5000 Population	1994	The positional accuracy varies with the source materials used, but generally the information is no better than the established national map Accuracy standards for 1:100,000-scale maps from the U.S. Geological Survey (USGS); thus it is NOT suitable for high-precision measurement applications such as engineering problems, property transfers, or other uses that might require highly accurate measurements of the earth's surface.	Statewide, complete		Geographic NAD83	None	FGDC compliant, but needs update, txt format	As needed
	New Mexico Geographic Names Information System: Populated Places	2001	Accuracy of these digital data is based upon the use of source graphics which are compiled to meet National Map Accuracy Standards. Comparison to the graphic source is used as control to assess digital positional accuracy. Duplications were removed.	Statewide, complete		Geographic NAD83	None	FGDC compliant, htm format	As needed

New Mexico Framework Layers
for Weston Survey
(June 2007)

Data Set Classification	Dataset name - Layer Name	Data Currency	Accuracy/Scale	Extent (Completeness)	Ground Sample resolution	Coordinate System	Fee Associated	Metadata (Completeness)	Update Frequency
	Census - Demographics	Updated monthly; Tables like SF-1 and SF-3 come from Year 2000	No idea about how accurate it is. Data taken during census and posted online.	Whole of NM - subsections include Indian reservations and pueblos. Counties and cities requested to update data including GIS TIGER files within 7.6 m or better.	N/A	N/A	Free from Website; there are some software that helps you convert data to GIS formats - those are chargeable. Its not necessary. ArcGIS does it on the fly. Washington DC Head Quarters sell some data on CD like special products and preprinted maps.	FGCD standard followed for metadata. NSGIC guidelines followed.	The American Community Survey Project updates data each month. Congress mandated this approach so that certain population census are done every month. Data is continuously updated now instead of that old long process of doing it once in every "n" years. Random sampling is done by the Census Bureau for selected areas. Concentration is not given on any particular area to eliminate skews.
Cadastral									

New Mexico Framework Layers
for Weston Survey
(June 2007)

Data Set Classification	Dataset name - Layer Name	Data Currency	Accuracy/Scale	Extent (Completeness)	Ground Sample resolution	Coordinate System	Fee Associated	Metadata (Completeness)	Update Frequency
Publicly Owned Lands									
	National Parks	1994	1:500000. The root-mean square error is generally .003 map units or less.	Statewide, complete as of August 1994		Geographic NAD83	None	FGDC compliant, needs updating, txt format	As needed
	USDA FS, Region 3, National Forests	1996	Unknown	Arizona and New Mexico, complete		Geographic NAD83	None	FGDC compliant, needs updating, txt format	As needed, can be updated from Region 3 website
	Surface Ownership	2006	Surface ownership data from individual 1:100,000 map series tiles were merged, edge matched and built in ArcInfo coverage format.	New Mexico		UTM Zone 13, NAD83, meters	None	Available in xml format	As needed, yearly
	Federal Subsurface Mineral Ownership	2006	Federal mineral ownership data from individual 1:100,000 map series tiles were merged, edge matched and built in ArcInfo coverage format. Two areas of subsurface (mineral) ownership in the northeast corner of the state were not collected by the BLM. The first area is defined as being between 35.5 and 37 degrees of latitude and between 103 and 104 degrees of longitude. The other area is defined as being between 36 and 36.5 degrees of latitude and between 104 and 105 degrees of longitude. Data was "filled in" in these areas from this Bureau of Mines coverage provided to the BLM by USGS. In these areas, this data, apparently, was thinned to the PLSS section level whereas the rest of the data collected by the BLM was not thinned.	New Mexico		UTM Zone 13, NAD83, meters	None	Available in xml format	As needed, yearly
Public Land Survey System (PLSS)									
	Public Land Survey System	2004	This data has been collected by the U.S. Bureau of Land Management (BLM) in New Mexico at both the New Mexico State Office and the various field offices. Collection began in the 1980's using the BLM's ADS software to digitize information at the 1:24,000 scale. In the mid to late 1990's the data was converted from ADS to ArcInfo software. Collection continued into the 1990s and has been updated regularly until January 2000 when it was merged into a statewide coverage. Some of the data has been replaced with Geographic Coordinate Data Base (GCDB) data. GCDB is a data base of calculated coordinates for survey points based on certain known control points adjusted between record survey data. Accuracy of this data is generally very high although this varies from point to point depending on the vintage of the actual survey. This data has been incorporated into the coverage mostly in the southern and east-central areas of New Mexico, where available.	New Mexico		UTM Zone 13, NAD83, meters	None	Available in xml format, not complete	Quarterly updates sent to Denver office

New Mexico Framework Layers
for Weston Survey
(June 2007)

Data Set Classification	Dataset name - Layer Name	Data Currency	Accuracy/Scale	Extent (Completeness)	Ground Sample resolution	Coordinate System	Fee Associated	Metadata (Completeness)	Update Frequency
Cadastral (parcels)	**N/A**	Unknown	N/A	60% of counties still to be collected	N/A	GCS North American 1983 (planned)	None	N/A	Bi-annual (planned)
Elevation									
Terrain (elevation)	**NM Color Shaded Relief**	2004	Color shaded relief georeferenced TIFF image for the State of New Mexico. Created by the U.S. BLM in New Mexico using 100 Meter Resolution USGS Digital Elevation Models.	New Mexico	100 meter	UTM Zone 13, NAD83, meters	None	xml format, not complete	As needed
	NM Black and White Shaded Relief	2004	Black and white shaded relief georeferenced TIFF image for the state of New Mexico. Created by the U.S. BLM in New Mexico using 100 Meter Resolution USGS Digital Elevation Models.		100 meter	UTM Zone 13, NAD83, meters	None	xml format, not complete	As needed
	National Elevation Database	1999	1:24000	New Mexico, three sections		Geographic, NAD83	None	Available, txt format	As needed
	10 m Digital Elevation Model	2001	1:24000	New Mexico (~10 quads missing along NM-TX border)	10 meter	UTM Zones 12 & 13, NAD27 or NAD83, meters	None	Generic metadata, txt format	As needed

New Mexico Framework Layers
for Weston Survey
(June 2007)

Data Set Classification	Dataset name - Layer Name	Data Currency	Accuracy/Scale	Extent (Completeness)	Ground Sample resolution	Coordinate System	Fee Associated	Metadata (Completeness)	Update Frequency
	500 ft Contours statewide	1992	1:250,000- These data meet National Mapping Accuracy Standards for 1:250,000 scale maps.	New Mexico		Geographic, NAD83	None	FGDC compliant, needs updating, txt format	As needed
	30 meter contours	2001	1:24,000 - This data set contains 30 meter contours for New Mexico derived from the National Elevation Dataset. The contour coverage was divided using the 100,000 index grid.	New Mexico		UTM, Zone 13, NAD83, meters	None	FGDC compliant, needs updating, txt format	As needed
Countywide									
Orthophotography									
	County Mosaics	2005/6	The DOQQ's have not been field checked by a third party for objective accuracy against ground features, but over 90% of permanent identifiable locations in the image have been sampled and found to adhere to within 3.0 meters of preexisting line work and imagery.	Individual counties with eight mile buffer	1 meter	NM Stateplane Zones, NAD83	Yes, due to special order because the file sizes are large.	FGDC compliant, xml format	As funding allows, and if new DOQQ series created
Transportation									
	Roads	2006	The horizontal spatial accuracy information present in these files is provided for the purposes of statistical analysis and census operations only. The TIGER/Line files may not be suitable for high-precision measurement applications such as engineering problems, property transfers, or other uses that might require highly accurate measurements of the earth's surface. Coordinates in the TIGER/Line files have six implied decimal places, but the positional accuracy of these coordinates is not as great as the six decimal places suggest. Based on 1:100,000.	Individual county		Geographic, NAD83	None	FGDC compliant, xml format	As needed, annual
	Railroads	2006	The horizontal spatial accuracy information present in these files is provided for the purposes of statistical analysis and census operations only. The TIGER/Line files may not be suitable for high-precision measurement applications such as engineering problems, property transfers, or other uses that might require highly accurate measurements of the earth's surface. Coordinates in the TIGER/Line files have six implied decimal places, but the positional accuracy of these coordinates is not as great as the six decimal places suggest. Based on 1:100,000.	Individual county		Geographic, NAD83	None	FGDC compliant, xml format	As needed, annual
	Airports	2006	The horizontal spatial accuracy information present in these files is provided for the purposes of statistical analysis and census operations only. The TIGER/Line files may not be suitable for high-precision measurement applications such as engineering problems, property transfers, or other uses that might require highly accurate measurements of the earth's surface. Coordinates in the TIGER/Line files have six implied decimal places, but the positional accuracy of these coordinates is not as great as the six decimal places suggest. Based on 1:100,000.	Individual county		Geographic, NAD83	None	FGDC compliant, xml format	As needed, annual
Hydrography									

New Mexico Framework Layers
for Weston Survey
(June 2007)

Data Set Classification	Dataset name - Layer Name	Data Currency	Accuracy/Scale	Extent (Completeness)	Ground Sample resolution	Coordinate System	Fee Associated	Metadata (Completeness)	Update Frequency
	Surface Water and Lakes	2006	The horizontal spatial accuracy information present in these files is provided for the purposes of statistical analysis and census operations only. The TIGER/Line files may not be suitable for high-precision measurement applications such as engineering problems, property transfers, or other uses that might require highly accurate measurements of the earth's surface. Coordinates in the TIGER/Line files have six implied decimal places, but the positional accuracy of these coordinates is not as great as the six decimal places suggest. Based on 1:100,000.	Individual county		Geographic, NAD83	None	FGDC compliant, xml format	As needed, annual
Soils									
	Soil Survey (SURGO)	2006/7	The accuracy of these digital data is based upon their compilation to base maps that meet National Map Accuracy Standards at a scale of 1 inch equals 1,000 feet. The difference in positional accuracy between the soil boundaries and special soil features locations in the field and their digitized map locations is unknown. The locational accuracy of soil delineations on the ground varies with the transition between map units. For example, on long gently sloping landscapes the transition occurs gradually over many feet. Where landscapes change abruptly from steep to level, the transition will be very narrow. Soil delineation boundaries and special soil features generally were digitized within 0.01 inch of their locations on the digitizing source. The digital map elements are edge matched between data sets. The data along each quadrangle edge are matched against the data for the adjacent quadrangle. Edge locations generally do not deviate from centerline to centerline by more than 0.01 inch.	New Mexico (minus the National Forests and White Sands Missile Range)		UTM Zone 13, NAD83, meters	None	FGDC compliant, xml format	As needed

New Mexico Framework Layers
for Weston Survey
(June 2007)

Data Set Classification	Dataset name - Layer Name	Known Data Gaps	Plans to Fill Gaps	Dataset Source, Availability	Dataset contact	Notes - Data Issues
Statewide						
Orthophotography						
2006 Digital Orthophotography						
	2006 Color (RGB)	None, completion of 2005 Series		http://rgis.unm.edu	Earth Data Analysis Center, MSC01 1110, 1 University of New Mexico, Albuquerque, NM 87131-0001 phone (505) 277-3622 fax (505) 277-3614	Available in download in .ecw format. If geotiffs are needed, please contact for special order and pricing information. Project completes dataset for 2005, partial state.
	2005-2006 Color Infrared (CIR)	None		http://rgis.unm.edu	Earth Data Analysis Center, MSC01 1110, 1 University of New Mexico, Albuquerque, NM 87131-0001 phone (505) 277-3622 fax (505) 277-3614	Available in download in .ecw format. If geotiffs are needed, please contact for special order and pricing information. Project completes dataset for 2005, partial state.
2005 Digital Orthophotography						
	2005 Color (RGB)	Yes	Completed with 2006 series	http://rgis.unm.edu	Earth Data Analysis Center, MSC01 1110, 1 University of New Mexico, Albuquerque, NM 87131-0001 phone (505) 277-3622 fax (505) 277-3614	Available in download in .ecw format. If geotiffs are needed, please contact for special order and pricing information. Project mostly flown in 2005, finished gap areas in 2006.
Transportation						
	GPS Roads	None		http://rgis.unm.edu	Earth Data Analysis Center, MSC01 1110, 1 University of New Mexico, Albuquerque, NM 87131-0001 phone (505) 277-3622 fax (505) 277-3614	Data collected by GPS
	New Mexico Airports	None		http://rgis.unm.edu	Earth Data Analysis Center, MSC01 1110, 1 University of New Mexico, Albuquerque, NM 87131-0001 phone (505) 277-3622 fax (505) 277-3614	This data set is a vector point digital data structure that contains the locations of General Public Use Airports in the State of New Mexico. It only contains those airports that the New Mexico State Highway and Transportation Department inspects. The point represents the center of the land owned by the airport.

New Mexico Framework Layers
for Weston Survey
(June 2007)

Data Set Classification	Dataset name - Layer Name	Known Data Gaps	Plans to Fill Gaps	Dataset Source, Availability	Dataset contact	Notes - Data Issues
	New Mexico Railroads (TIGER 2000)	Unknown	TIGER 2006SE data	http://rgis.unm.edu	U.S. Department of Commerce, U.S. Census Bureau, Geography Division, Geographic Products Management Branch 4600 Silver Hill Road, Stop 7400, Washington, DC 20233-7400 phone (301) 763-1128 fax (301) 763-4710	Statewide railroad coverage from TIGER data, Census Bureau, to be supplemented with 2006 SE TIGER data
	E 911 (NM_RCL)	Military installations and most tribal land, including almost all Navajo lands / also Angel Fire and some municipalities	Gaps will be filled as NM Dept of Finance and Administration, Local Government Division identifies, recruits and prepares additional data sources	Available only by agreement with NM Dept of Finance and Administration, Local Government Division	James Stewart, NM 9-1-1 GIS Database Manager, Spatial Data Research, Inc., 14 E 8th St, Lawrence, KS 66044 / 785-842-0447 / Jstewart@SDRMaps.com	This data layer is updated with the arrival of new data from one of several local Data Sources across the state. Each Data Source is assigned an upload deadline once per month. Attribution fields are reformatted but the Database Manager makes no direct edits to attribution contents or geometry. Also, only rough edge matching work is done as data is integrated. Because each Data Source maintains the "live" data for each area locally, the focus is on communicating required changes to Data Sources rather than in repeating edits after upload. Each county/ city/ reservations/ pueblos own and maintain their address data sets and they are not part of the statewide project
Hydrography						
	New Mexico Surface Water and Surface Drainage	None detected	See NHD	http://rgis.unm.edu	Earth Data Analysis Center, MSC01 1110, 1 University of New Mexico, Albuquerque, NM 87131-0001 phone (505) 277-3622 fax (505) 277-3614	Digitized from USGS 1:500,000 mylar map
	National Hydrography Dataset	None		http://nhd.usgs.gov/data.html	Gar Clarke, GIT Coordinator Information Technology Systems Bureau Office of the State Engineer Bataan Memorial Building, Suite 130 407 Galisteo Street Santa Fe, New Mexico 87501 Tel: (505) 827-6192 Fax: (505) 827-6069	USGS created the original dataset from 1:100K maps. The data were revised to reflect 24K data in 2006. Then USGS put some of the NHD units together in the form of sub-regions. Both the individual units and the sub-regions are available through RGIS. The Office of the State Engineer will be the data steward for this dataset.
Political Boundaries						

New Mexico Framework Layers
for Weston Survey
(June 2007)

Data Set Classification	Dataset name - Layer Name	Known Data Gaps	Plans to Fill Gaps	Dataset Source, Availability	Dataset contact	Notes - Data Issues
	State Boundary	None		http://www.census.gov/geo/www/tiger	U.S. Department of Commerce, U.S. Census Bureau, Geography Division, Geographic Products Management Branch 4600 Silver Hill Road, Stop 7400, Washington, DC 20233-7400 phone (301) 763-1128 fax (301) 763-4710	State Boundary from Census Bureau
	County Boundaries	None		http://www.census.gov/geo/www/tiger	U.S. Department of Commerce, U.S. Census Bureau, Geography Division, Geographic Products Management Branch 4600 Silver Hill Road, Stop 7400, Washington, DC 20233-7400 phone (301) 763-1128 fax (301) 763-4710	County Boundaries from 2000 Census
	BLM Land Grant Boundaries	None		http://www.nm.blm.gov/nmso/nm952/geo_sci/datasets_metadata_index.html	Allen Bollschweiler, GeoSciences Team Lead (GIS/GCDB), BLM, P.O. Box 27115, 1474 Rodeo Rd., Santa Fe, NM phone (505) 438-7442	BLM data
	Indian and Military Reservation Boundaries	None		http://rgis.unm.edu	Earth Data Analysis Center, MSC01 1110, 1 University of New Mexico, Albuquerque, NM 87131-0001 phone (505) 277-3622 fax (505) 277-3614	Created from combining Census data for Indian Lands, with BLM Land Status data listed as Military Reservations.
	Voting Precincts	None		http://rgis.unm.edu/	Earth Data Analysis Center, MSC01 1110, 1 University of New Mexico, Albuquerque, NM 87131-0001 phone (505) 277-3622 fax (505) 277-3614	NM Secretary of State

New Mexico Framework Layers
for Weston Survey
(June 2007)

Data Set Classification	Dataset name - Layer Name	Known Data Gaps	Plans to Fill Gaps	Dataset Source, Availability	Dataset contact	Notes - Data Issues
	State Legislative Boundaries, both Upper and Lower Chambers	None		http://www.census.gov/geo/www/tiger	U.S. Department of Commerce, U.S. Census Bureau, Geography Division, Geographic Products Management Branch 4600 Silver Hill Road, Stop 7400, Washington, DC 20233-7400 phone (301) 763-1128 fax (301) 763-4710	TIGER 2006, Second Edition
	Incorporates and Designated Places	None		http://www.census.gov/geo/www/tiger	U.S. Department of Commerce, U.S. Census Bureau, Geography Division, Geographic Products Management Branch 4600 Silver Hill Road, Stop 7400, Washington, DC 20233-7400 phone (301) 763-1128 fax (301) 763-4710	Places as listed from 2000 Census
	Metro Boundary of Towns > 5000 Population	None		http://www.census.gov/geo/www/tiger	U.S. Department of Commerce, U.S. Census Bureau, Geography Division, Geographic Products Management Branch 4600 Silver Hill Road, Stop 7400, Washington, DC 20233-7400 phone (301) 763-1128 fax (301) 763-4710	Metro Areas from 2000 Census
	New Mexico Geographic Names Information System: Populated Places	None		http://rgis.unm.edu	Earth Data Analysis Center, MSC01 1110, 1 University of New Mexico, Albuquerque, NM 87131-0001 phone (505) 277-3622 fax (505) 277-3614	USGS Geographic Names Information System, supplied by New Mexico Natural Heritage Program

New Mexico Framework Layers
for Weston Survey
(June 2007)

Data Set Classification	Dataset name - Layer Name	Known Data Gaps	Plans to Fill Gaps	Dataset Source, Availability	Dataset contact	Notes - Data Issues
	Census - Demographics	No known data gaps. Census Bureau pays to fly or drive roads (Harris corporation) to get required data.	N/A	www.census.gov	Pat Rodriguez, 6900 West Jefferson Ave, Lakewood CO 80235 (303) 264-0227	Issues involing the accuracy of the population counts as discussed in the report.
Cadastral						

New Mexico Framework Layers
for Weston Survey
(June 2007)

Data Set Classification	Dataset name - Layer Name	Known Data Gaps	Plans to Fill Gaps	Dataset Source, Availability	Dataset contact	Notes - Data Issues
Publicly Owned Lands						
	National Parks	None		http://rgis.unm.edu	Earth Data Analysis Center, MSC01 1110, 1 University of New Mexico, Albuquerque, NM 87131-0001 phone (505) 277-3622 fax (505) 277-3614	Digitized from various sources
	USDA FS, Region 3, National Forests	None		http://rgis.unm.edu	USDA Forest Service, Southwestern Region, Regional GIS Coordinator, 333 Broadway SE, Albuquerque, New Mexico, 87102 Tel. (505) 842-3292	Received from USDA FS with no metadata
	Surface Ownership	None		http://www.nm.blm.gov/nmso/nm952/geo_sci/datasets_metadata_index.html	Allen Bollschweiler, GeoSciences Team Lead (GIS/GCDB), BLM, P.O. Box 27115, 1474 Rodeo Rd., Santa Fe, NM phone (505) 438-7442	BLM data
	Federal Subsurface Mineral Ownership	None		http://www.nm.blm.gov/nmso/nm952/geo_sci/datasets_metadata_index.html	Allen Bollschweiler, GeoSciences Team Lead (GIS/GCDB), BLM, P.O. Box 27115, 1474 Rodeo Rd., Santa Fe, NM phone (505) 438-7442	BLM data
Public Land Survey System (PLSS)						
	Public Land Survey System	(1) Complex Townships along the Rio Grande corridor - category 5 & 6. They have plats and records data but nothing compiled in digital format for GCDB. (2) Land Grants (Pueblos, Spanish, Mexican) resulted in gaps - Federal Government surveyed exterior of grant boundaries. County and State need to manage these lands for tax purposes; so they made their own grid. BLM has no record where the data comes from; BLM will never do the survey here as these are not Federal Lands. (3) GCDB provide polygons for water without any details of section number, directions, or area. (4) Overlapping survey on same line or area at different times don't match. (5) Sometimes actual gaps in Federal Records are found (not common). (6) NW corner of state has never been surveyed - category 2. BLM can produce theoretical coordinates using protraction diagram.	(1) Funding is required to survey some unsurveyed areas. (2) Coordination is required to conduct surveys between BLM, Local and State govt. (3)BLM will help other agencies to survey Grant Lands with technology and know-how.	http://www.nm.blm.gov/nmso/nm952/geo_sci/datasets_metadata_index.html	Robert Casias, Cadastral Chief, (505) 438-7890 Allen Bollschweiler, GeoSciences Team Lead (GIS/GCDB), BLM, P.O. Box 27115, 1474 Rodeo Rd., Santa Fe, NM phone (505) 438-7442	BLM data

New Mexico Framework Layers
for Weston Survey
(June 2007)

Data Set Classification	Dataset name - Layer Name	Known Data Gaps	Plans to Fill Gaps	Dataset Source, Availability	Dataset contact	Notes - Data Issues
Cadastral (parcels)	**N/A**	60% of counties still to be collected	85% collected for "pre-stage" of 2008 fire season planned through March 2008; seamless state layer completed following in May 2008	N/A	Deniz Berdine, GIS Coordinator, New Mexico Taxation and Revenue Department, Property Tax Division, 1220 S. St. Francis Drive P O Box 25126 Santa Fe, NM 87504-5126 Phone: (505) 827-0892 Fax: (505) 827-0782 Cell: (505) 670-3483	Please see New Mexico Parcel Workgroup Forum (http://nmpdwg1.informe.com/) to review status of effort to design and build statewide layer. Guiding documents may be located at following links: Cost Estimate for Completion and Implementation of the Private Sector Parcel Component of the Cadastral NSDI FGDC Cadastral Data Subcommittee http://www.nationalcad.org/data/documents/CostsofParcelConversionAug2006.pdf; Cadastral Core Data Draft Report – October 2004 Version5 http://www.nationalcad.org/data/documents/Cadastral%20Core%20Data%20Version%205.pdf; Cadastral NSDI Reference Document July 2006 http://www.nationalcad.org/data/documents/Cadastral%20NSDI%20Reference%20Document%20v10.pdf; Arkansas State Land Information Board "Cadastral Mapping Standard" – 07/02/2004 http://www.gis.state.ar.us/Downloads/CAMP/Resources/Standards/Cad_standard_FINAL.pdf
Elevation						
Terrain (elevation)	**NM Color Shaded Relief**	None		http://www.nm.blm.gov/nmso/nm952/geo_sci/datasets_metadata_index.html	Allen Bollschweiler, GeoSciences Team Lead (GIS/GCDB), BLM, P.O. Box 27115, 1474 Rodeo Rd., Santa Fe, NM phone (505) 438-7442	BLM data
	NM Black and White Shaded Relief	None		http://www.nm.blm.gov/nmso/nm952/geo_sci/datasets_metadata_index.html	Allen Bollschweiler, GeoSciences Team Lead (GIS/GCDB), BLM, P.O. Box 27115, 1474 Rodeo Rd., Santa Fe, NM phone (505) 438-7442	BLM data
	National Elevation Database	None		http://ned.usgs.gov/	Customer Services, U. S. Geological Survey, EROS Data Center, 47914 252nd Street, Sioux Falls, SD 57198-0001 Tel: 800-252-4547, Tel: 605-594-6151 Fax: 605-594-6589	USGS Data
	10 m Digital Elevation Model	~10 quads missing along NM - TX border	Data not available	http://rgis.unm.edu	Customer Services, U. S. Geological Survey, EROS Data Center, 47914 252nd Street, Souix Falls, SD 57198-0001 Tel: 800-252-4547, Tel: 605-594-6151 Fax: 605-594-6589	USGS Data

New Mexico Framework Layers
for Weston Survey
(June 2007)

Data Set Classification	Dataset name - Layer Name	Known Data Gaps	Plans to Fill Gaps	Dataset Source, Availability	Dataset contact	Notes - Data Issues
	500 ft Contours statewide	None		http://rgis.unm.edu	Customer Services, U. S. Geological Survey, EROS Data Center, 47914 252nd Street, Souix Falls, SD 57198-0001 Tel: 800-252-4547, Tel: 605-594-6151 Fax: 605-594-6589	USGS Data
	30 meter contours	None		http://rgis.unm.edu	Earth Data Analysis Center, MSC01 1110, 1 University of New Mexico, Albuquerque, NM 87131-0001 phone (505) 277-3622 fax (505) 277-3614	Based on NED data, clipped to 100K boundaries
Countywide						
Orthophotography						
	County Mosaics	None		http://rgis.unm.edu	Earth Data Analysis Center, MSC01 1110, 1 University of New Mexico, Albuquerque, NM 87131-0001 phone (505) 277-3622 fax (505) 277-3614	Mosaic comprised of all DOQQs that comprise county, with eight mile buffer
Transportation						
	Roads	None		http://www.census.gov/geo/www/tiger	U.S. Department of Commerce, U.S. Census Bureau, Geography Division, Geographic Products Management Branch 4600 Silver Hill Road, Stop 7400, Washington, DC 20233-7400 phone (301) 763-1128 fax (301) 763-4710	TIGER 2006 Second Edition, by county
	Railroads	None		http://www.census.gov/geo/www/tiger	U.S. Department of Commerce, U.S. Census Bureau, Geography Division, Geographic Products Management Branch 4600 Silver Hill Road, Stop 7400, Washington, DC 20233-7400 phone (301) 763-1128 fax (301) 763-4710	TIGER 2006 Second Edition, by county
	Airports	None		http://www.census.gov/geo/www/tiger	U.S. Department of Commerce, U.S. Census Bureau, Geography Division, Geographic Products Management Branch 4600 Silver Hill Road, Stop 7400, Washington, DC 20233-7400 phone (301) 763-1128 fax (301) 763-4710	TIGER 2006 Second Edition, by county
Hydrography						

New Mexico Framework Layers
for Weston Survey
(June 2007)

Data Set Classification	Dataset name - Layer Name	Known Data Gaps	Plans to Fill Gaps	Dataset Source, Availability	Dataset contact	Notes - Data Issues
	Surface Water and Lakes	None		http://www.census.gov/geo/www/tiger	U.S. Department of Commerce, U.S. Census Bureau, Geography Division, Geographic Products Management Branch 4600 Silver Hill Road, Stop 7400, Washington, DC 20233-7400 phone (301) 763-1128 fax (301) 763-4710	TIGER 2006 Second Edition, by county
Soils						
	Soil Survey (SURGO)	The areas of the five/six national forests and White Sands Missile Range are not included in the data.	As data becomes available.	http://SoilDataMart.nrcs.usda.gov/	U.S. Department of Agriculture, Natural Resources Conservation Service 6200 Jefferson, NE, Suite 305, Albuquerque, NM 87109 Tel. (505) 761-4433 Fax: (505) 761-4462	Updated as Needed

APPENDIX C

LIST OF STAKEHOLDERS FOR NEW MEXICO GIS STRATEGIC PLAN

APPENDIX C

List of Stakeholders for New Mexico GIS Strategic Plan

Name	Agency & Organization	Email	Phone Number
Larry Brotman	Taxation & Revenue	larry.brotman@state.nm.us	505-827-2318
Kathy Rogers	DAC Flood Commission	kathyr@donaanacounty.org	505-525-5552
Mike Ingles	EDCA/UNM	mingli@edac.unm.edu	505-277-8622 x235
Gary Kress	USGA	gekress@usgs.gov	303-202-4451
Gar Clarke	OSF	-	505-887-6182
Rick Koehler	EMNRD	rickkoehler@state.nm.us	505-476-3417
Mike Baca	OCIO	mike.baca@state.nm.us	505-670-6535
Gerald Nichols	Taos County	gnichols@newmex.com	505-737-6366
Erle Wright	Santa Fe County (NM Assoc of Counties)	ewright@co.santa-fe.nm.us	505-986-6350
Connie Stone	County of Lincoln	gis@thlarosa.net	505-648-2385 x140
Jon Phillips	Bernalillo County	jphillips@bernco.gov	505-221-1690
Rich Friedman	City of Farmington	rfriedman@fmtn.org	505-599-1218
Vincent Benoit	BOR	vbenoit@uc.usbr.gov	505-462-3628
Joseph Schmitt	BLM/GCDB	jschmitt@blm.gov	505-438-7474
Robert Casias	BLM/GCDB	rcasias@blm.gov	505-438-7890
John Peterson	Corp of Engineers	john./.peterson@usacearmy.mil	505-342-3664
Candace Bogart	USFS	cbogart@fs.fed.us	505-843-3858
Richard Middleton	Los Alamos Lab	rsm@lanl.gov	505-665-7259
Johnathon AuBuchon	Bureau of Reclamation	jonbuchon@uc.usbr.gov	505-462-3646
Paul Notab	BIA	notabpw@yahoo.com	505-863-8385
Joilynn Garcia	FSA	joilynn.garcia@nm.usda.gov	505-761-4911
Roger Durall	USGS	radurell@usgs.gov	505-830-7914
Denise Bleakly	Sandia National Labs	drbleak@sandia.gov	505-284-2535 x252
Bill Stone	National Geodetic Survey	william.stone@noaa.gov	505-277-3622
Linda Branch	NRCS	linda.branch@nm.usda.gov	505-761-4438
Dave Gilbert	State DHS.EM	dave.gilbert@state.nm.us	505-476-9678
Denise Chavez	SIPI	dchavez@sipi.bia.edu	505-346-7714
Richard Byrne	Emnrd-ITO	rbyrne@state.nm.us	505-476-3285
Donica Sharpe	State DFA/911	donica.sharpe@state.nm.us	505-793-2911
Larry Brotman	Taxation & Revenue	larry.brotman@state.nm.us	505-827-2318
Leland Pierce	NM Dept Game & Fish	leland.pierce@state.nm.us	505-476-8094
Bill Range	DFA E9111 Program	bill.range@state.nm.us	505-824-4804
Rick Koehler	Emnrd-ITO	rickkoehler@state.nm.us	505-476-3417
Earl F Burkholder	NMSU	eburkhol@nmsu.edu	505-646-6067
Renee Martinez	State Engineer	j.renee.martinez@state.nm.us	505-827-6131
Jim Benenson	Environment	jim.benenson@state.nm.us	505-827-1701
Mike Baca	OCIO	mike.baca@state.nm.us	505-670-6535
Glenn Condon	NMDOT	glenn.condon@state.nm.us	505-677-5229

Weston Solutions, Inc.

190 Queen Anne Avenue North
Suite 200
Seattle, WA 98109
(206) 521-7600
Fax: (206) 521-7601

Suite 200
2 Park Square, NE
6565 Americas Parkway
Albuquerque, NM 87110-8172
(505) 837-6520
Fax: (505) 837-6550